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Report From District IV

By B. W. BOOKER, Assistant State Highway Engineer

WITH population in District IV racing toward the 1970 prediction of 5,000,000, traffic increases in the area demand major routes in all directions from the central core of the metropolitan area. Freeway development is therefore extensive in all populated areas including that in the central core. Construction and planning is well advanced for freeway systems radiating from such communities and cities as Santa Rosa, San Rafael, Richmond, Concord, Walnut Creek, Hayward, Fremont, San Mateo, San Jose, Los Gatos and Santa Cruz.

The year of 1958 witnessed many public meetings and hearings resulting in the adoption of freeway route location by the Highway Commission on a total of 52 miles in our district. This was accomplished in spite of the extremely complex problems of route location particularly in two of the major routes located during the year: the Junipero Serra Freeway extending from San Francisco to San Jose and to the south and the Grove-Shafter Freeway in Oakland, extending from the Nimitz Freeway to Contra Costa County.

The Junipero Serra Freeway adoption followed more than 40 informational meetings, map displays and three official public meetings held in areas adjacent to the routing by the Division of Highways before recommendation of a route was made by the State Highway Engineer to the California Highway Commission. In accordance with its established policy

for route adoptions, the commission itself held two public hearings in the area subsequent to the recommendation and prior to route adoption.

The Grove-Shafter location, though shorter in length than the Junipero Serra, was no less complex, involving location through heavily developed areas.

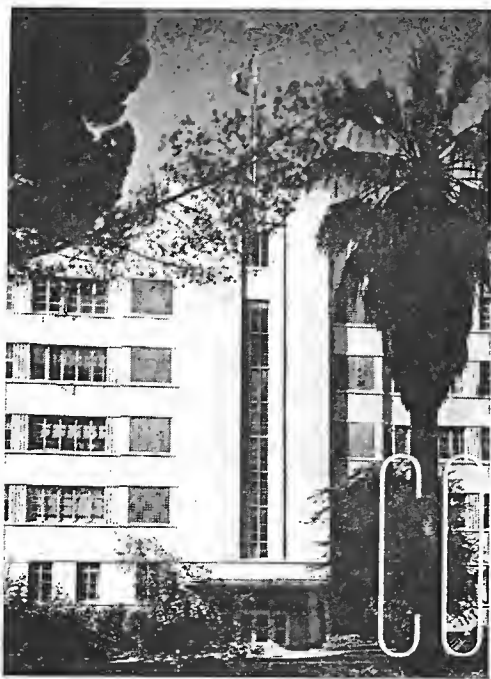
Meetings Held

Unchronicled herein, though, and in addition to local activities, are the hundreds of meetings and conferences required of the Division of Highways personnel engaged in planning of these route locations. Conferences with local executives, planners, authorities in public works, fire, police, schools, health, parks, cemeteries, as well as churches, civic-minded organizations, industry, commerce, utilities and individuals in general are directed toward assurance that all factors of our way of life are appraised in the development of every reasonable alternate for route selections for consideration in the final determination of the route.

The year 1958 also witnessed much progress in assuring immediate future completion of extensive sections of continuous freeway systems from the metropolitan core. In this year, the

PHOTOS, UPPER—A scenic section of US 101 in Marin County. MIDDLE—An aerial of the Boyshore Freeway in Palo Alto. The University Avenue interchange is in the center of the picture. LOWER—US 40 looking south through the Big Cut from above the approaches to the twin Carquinez Bridges.





Public Works Building
Twelfth and N Streets
Sacramento

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last links accomplishing continuous freeway from San Jose to Oakland were completed. Construction of the last project on U. S. 40 between Oakland and north of Vallejo is now in progress. When this 2.3-mile project is completed in early 1960 there will be a continuous freeway in service from south of San Jose to north of Vallejo. Also completed were projects extending the Embarcadero Freeway in San Francisco to Broadway and the Bayshore Freeway to Palo Alto. Nearly completed is extension of the Central Freeway in San Francisco to Turk Street. These improvements, together with construction to be completed in late 1960, will provide continuous freeway from Broadway in the downtown financial area of San Francisco or from Turk Street in the Civic Center area of San Francisco to Sunnyvale. Construction now underway extending the Bayshore Freeway northerly in the San Jose area to Brokaw Road leaves only a six-mile section to be financed to provide continuous freeway service from inner San Francisco to south of San Jose. Construction of the last link of the Route 5 Freeway in San Jose is also financed assuring early continuous freeway service from San Francisco via San Jose to beyond Los Gatos. Near future completion of continuous freeway service was also assured on US 101 northerly of San Francisco with the completion of one project at the San Quentin Wye and the start of construction of two projects: one at Greenbrae and the other from US 101 to the completed freeway approaches to the Richmond-San Rafael Bridge. When these projects are completed, continuous freeway service will exist from San Francisco to north of San Rafael and also to Richmond.

Spectacular Project

Among the year's accomplishments involving connecting links, perhaps the most impressive of the year was the completion of the additional Carquinez Bridge with its complex system of approaches, and the five miles of freeway which runs southerly to meet completed sections of US 40 in the hills above Hercules. While the



One of the bridges under construction at Corte Madero Creek on U. S. 101 in Marin County. The old bridge and lift span will be replaced by a new high level structure.

project is spectacular in its own magnitude—the huge structure duplicating the existing one, the graceful curves of interchange ramps serving the bridges from all directions and the monumental cut through high hills southerly from the strait—the most impressive feature is the saving of lives, time and miles between Vallejo and the San Francisco-Oakland Bay Bridge. The old route of transcontinental US 40 through growing cities and through the varied topography of the Bay's eastern shore had long been inadequate. Only a bold solution to the problems involving direct routing along new alignment could properly cope with tremendous volumes, current and predicted, which the artery serves. The completion of this facility saves 20 minutes between Oakland and Carquinez Bridge as compared to the old route. During summer weekends the savings amount to more than an hour.

The system of freeways which has been planned throughout our area for

many years through co-ordination with local authorities is predicated on an integrated system of transportation utilizing expansion of existing facilities. About one-third of the freeway system as planned is completed and can only be considered as the first stage of the network. *It must be built in its entirety to be fully effective.* The congestion occasioned on completed portions of the system such as the Nimitz and Bayshore Freeways during peak hours, is not a reflection of inadequate capacity of these facilities. It is an indication that they are being called upon to serve considerable traffic volumes which would be carried by other portions of the planned system if such were available today. Toward this end, the early construction of the MacArthur and Junipero Serra Freeways, as well as other facilities both state and local, is being expedited.

Let us review in some detail the overall picture of freeway development along the various routes.

US 40—San Francisco to Carquinez Bridge

Starting at the intersection of James Lick (Bayshore) Freeway and Central Freeway at 13th Street in San Francisco, US 40 proceeds across the San Francisco-Oakland Bay Bridge (US 40 and 50) and northerly via the Eastshore Freeway through Richmond to the Carquinez Bridge and points north and east.

The eight-lane freeway from the distribution structure to south of the El Cerrito Overhead on US 40 was completed in November of 1956. This portion of U. S. 40 is also Sign Route 17. A landscaping project costing approximately \$235,000 is presently under way within these limits.

The last link of freeway between the Bay Bridge and Carquinez Straits is presently being constructed from south of El Cerrito Overhead to Jefferson Avenue in Richmond. The 2.3 mile contract is being performed as a joint venture by Piombo Construction Company, M & K Corporation and Connolly Pacific Company. It is esti-

mated to cost approximately \$5,583,000 and is expected to be completed in January of 1960. Three interchanges and a pedestrian overcrossing are included in the development of this six-lane freeway facility.

Immediately to the north of the portion now under construction, 4.8 miles of freeway extending to Hilltop Drive, north of San Pablo, has been open to traffic since early 1957. In keeping with the Division of Highways policy of opening completed portions of freeway as soon as possible, a temporary connection from the freeway to the old highway just south of Rodeo was constructed and a major portion of the 4.9-mile project between Hilltop Drive and Hercules, which was constructed by McCammon-Wunderlich and Wunderlich Contracting Company, was opened to traffic in February of 1958. The remaining portion to Crockett was

opened to traffic in November of 1958. Contractors on this \$7,320,000 project was Ferry Brothers, J. M. Ferry, Peter L. Ferry and L. A. and R. S. Crow. This portion of the freeway contains the largest highway cut in the United States; being 3,000 feet long, 1,370 feet wide at the top and 300 feet deep.

Also opened to traffic in November, 1958, was the new bridge constructed easterly of and parallel to the existing bridge across Carquinez Straits. It is presently carrying two lanes of traffic in each direction. Temporary connections have been provided at each end to divert traffic during the completion of an additional contract for the Crockett approach ramp connection and modification of the present bridge which will carry three lanes of southbound traffic; the new bridge then will carry four lanes of northbound traffic. The contractor on this

work is Rothschild, Raffin and Weirick and the cost is approximately \$1,315,000. The existing bridge is expected to be reopened to traffic in July of this year.

Also completed this year have been signing and landscaping projects on the completed portions of the freeway north of Jefferson Avenue in Richmond.

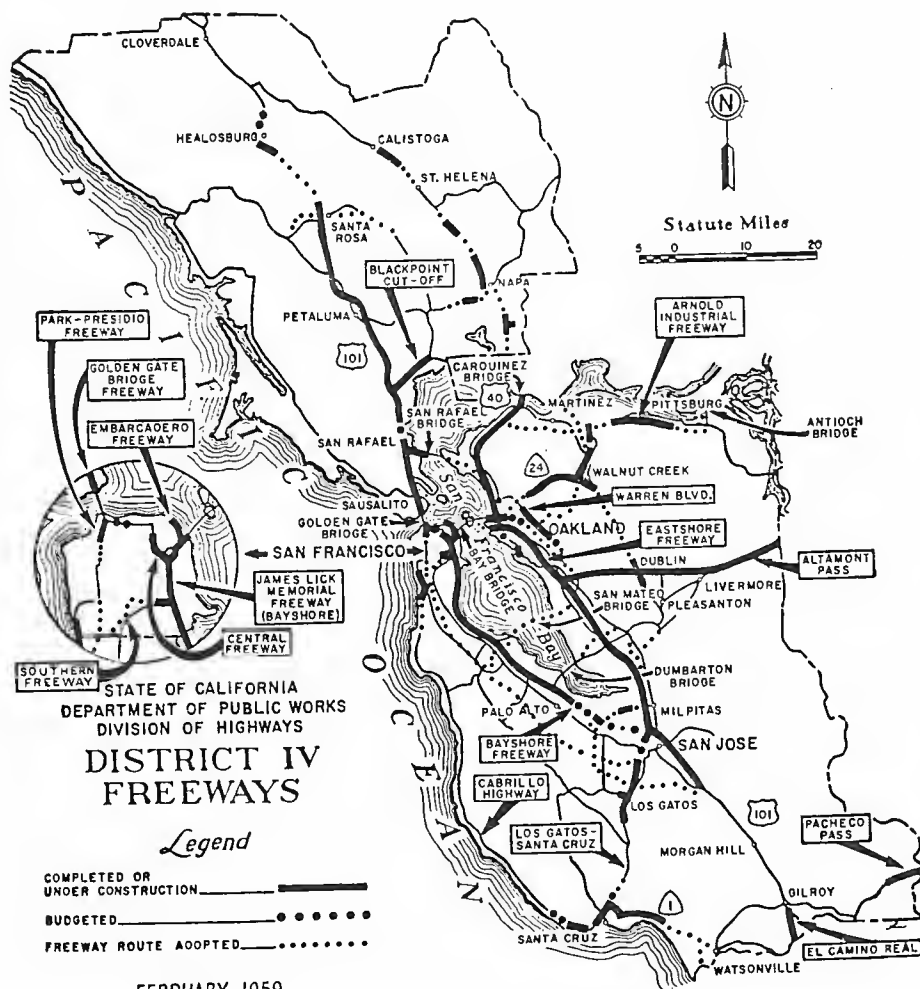
North of State Sign Route 4 (Arnold Industrial Freeway), this project was financed by special toll bridge bonds as an approach to the Carquinez Bridge.

US 50—Bay Bridge to Castro Valley

Design studies are proceeding on the entire 15.3 miles of the future MacArthur Freeway routing between the distribution structure and the completed freeway at Castro Valley to the east. The first construction projects will be at the western extremities and funds in the amount of \$10,000,000 have been included in the 1959-60 Budget to start construction of this eight-lane interstate facility between the distribution structure and Grand Avenue. Additional funds will be required in a future budget to complete this portion; the total construction cost of which is estimated at \$15,000,000. A total of \$39,166,000 has been expended or budgeted for rights-of-way acquisition on this major facility to date. The expediting of construction of this entire interstate freeway is anticipated and should provide relief to congestion now occasioned at peak hours on the Nimitz Freeway which is carrying considerable US 50 traffic at present.

Castro Valley to San Joaquin County Line

Freeway construction was completed in 1957 between Center Street in Castro Valley and Dublin, and to the east US 50 is an expressway with controlled number of intersections at grade. Studies are now under way for the future elimination of at-grade intersections by construction of interchanges along this interstate route. While future elimination of the intersections was contemplated at the time of original construction and some of the right-of-way acquired at that time, detailed design was not completed.



mate six-lane, freeway over the Russian River. Two million seven hundred fifteen thousand dollars is included in the 1959-60 Fiscal Year Budget to extend the Healdsburg Bypass freeway 4.1 miles to a connection with the present highway at Lytton.

Design for the other portions of the initial four-lane facility northerly of Santa Rosa to Lytton is well advanced. An expressway with some grade separation structures is being planned through this section. From Lytton to the Mendocino county line, studies for future development to freeway standards continue. Informational meetings have been held with the technical staffs of the local agencies and public hearings leading to final route adoption are anticipated in the near future.

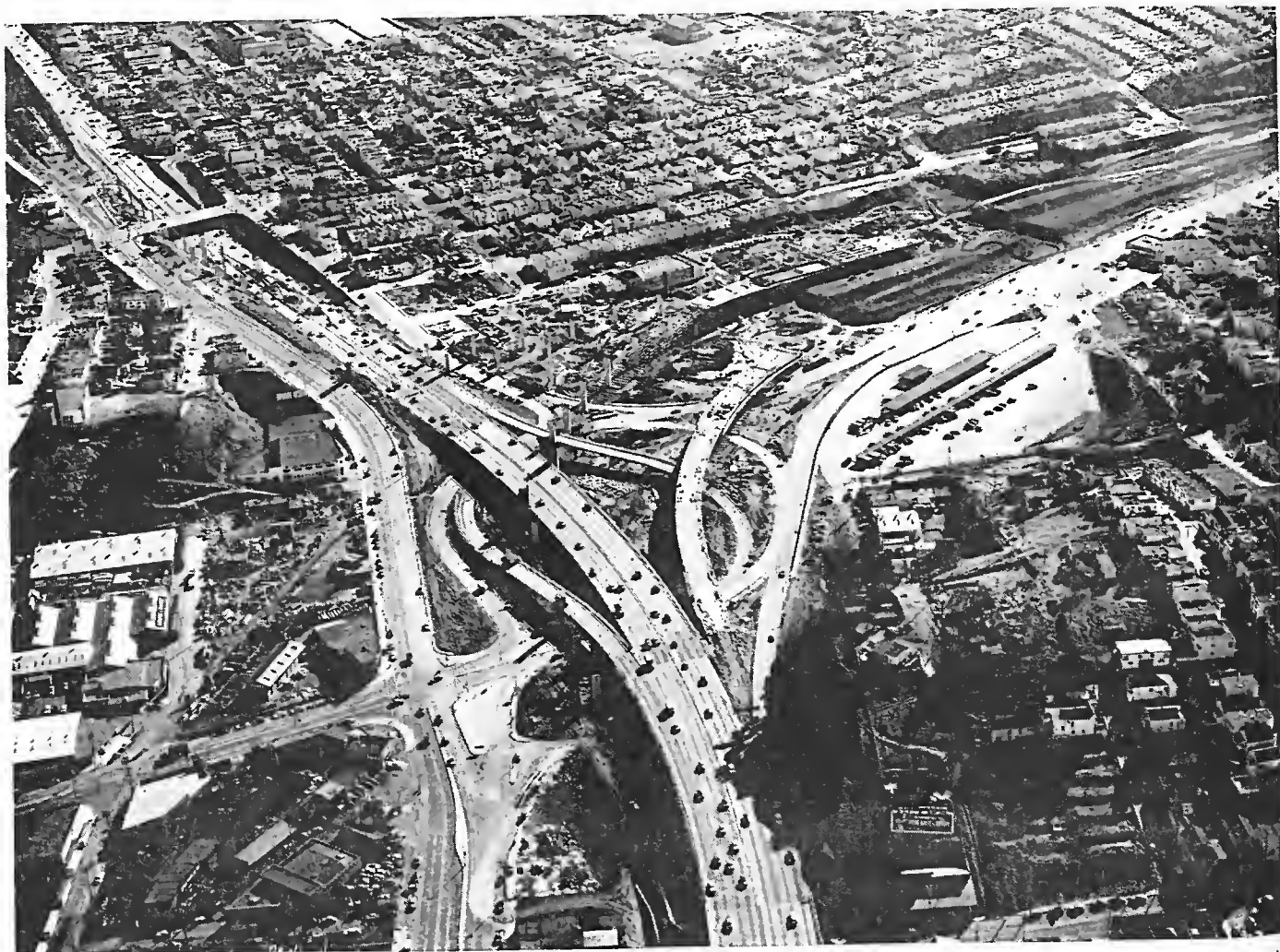
Approximately \$12,500,000 has been expended or budgeted for rights-of-way acquisition on US 101 from the Golden Gate Bridge to Lytton and \$34,043,000 has been expended for construction of the 50.5 miles now completed.

US 101 (Bypass)—San Francisco to Palo Alto

From its intersection with US 101 at Alemany Boulevard in San Francisco US 101 Bypass is mostly referred to as the Bayshore Freeway as far as San Jose. With several projects on this route included in the 1959-60 Fiscal Year construction program there are approximately six miles from Fair Oaks Avenue in Sunnyvale to Brokaw Road near San Jose remaining to be financed for completion of this route to freeway standards between San Francisco and San Jose.

While a continuous full freeway is in service between these limits, other improvements are continuing along this portion of the route. Now under contract is a landscaping project across the recently completed "overwater fill" at Candlestick Point. Completed this year were bus stops at the Third Avenue Interchange in San Mateo at a cost of \$41,000. Under construction is a revision of the East Hillsdale Boulevard Interchange and landscaping improvements between Peninsular Avenue and 16th Avenue in San Mateo.

Heavy turning movements during peak hours at various interchanges, providing for local service southerly of South San Francisco to San Mateo, have dictated early expansion of the present six-lane between Colma Creek near South San Francisco and Penin-



When completed this interchange on the James Lick Memorial Freeway (Bayshore) in San Francisco will connect with the first unit of the Southern Freeway under construction in the right middleground.

sular Avenue Interchange serving Burlingame and San Mateo. A \$1,900,000 construction project will be under way in the 1959-60 Fiscal Year which will add an additional lane in each direction. The added lanes will, in general, be constructed along the outside of existing lanes without reduction in median width separating directions of travel. It will, however, be necessary to transition the widening from the outside to the median area at interchange locations. The widening will be accomplished within the existing rights-of-way.

From Bransten Road to the Santa Clara county line, the eight miles has been constructed as four separate projects. The first of these was the Willow Road Interchange completed in 1956. The second contract between Willow Road and 0.5 mile south of the Santa Clara county line was completed in June of 1958 by Charles L. Harney, Inc. Construction on this 2.2-mile section cost \$1,832,000.

The two-mile project extending north of Marsh Road, the third project, was also completed in June of 1958. Like the other three, it provided an initial six-lane, ultimate eight-lane freeway at a cost of \$1,697,000. The contractor on this project was also Charles L. Harney, Inc.

Linking the above three projects and the completed freeway to the north, the 3.8-mile relocation at Redwood City from Bransten Road to Marsh Road was completed in July of 1958. The \$5,221,000 project was performed as a joint venture by Piombo Construction Co., M & K Corporation, and Connolly and Pacific Co.

Additional improvements are also contemplated during this next year on already completed portions of the freeway. Funds are included in the 1959-60 Budget in the amount of \$200,000 for the landscaping project between Harbor Boulevard in Redwood City and the Santa Clara county line.

US 101 (Bypass)—Palo Alto to San Jose

Contracts are under way for the improvement of much of this section. Presently under construction is the interchange at the intersection with Sign Route 9. This project, costing approximately \$1,257,000, will include



UPPER—US 101 in Marin County north of the Golden Gate Bridge. LOWER—The new Petaluma Creek Bridge on Sign Route 37 at the north end of San Francisco Bay.

an overpass structure carrying Mountain View-Alviso traffic over Bay-shore Freeway and short sections of

six-lane and four-lane divided highway within the interchange area. The contract on this portion is being per-

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formed as a joint venture by Dan Caputo and M. J. B. Construction Company.

Also under construction is 4.4 miles of freeway extension from the San Mateo-Santa Clara county line to Stierlin Road near Moffett Field costing approximately \$3,465,000. This portion is being constructed by L. C. Smith Company and Concar Ranch and Enterprises.

A further extension to Fair Oaks Avenue in Sunnyvale will be under way this year with \$3,947,000 included in the 1959-60 Fiscal Year construction program.

The section from 0.5 mile north of Brokaw Road to Taylor Street, 2.7 miles long, is now under construction. Estimated cost is approximately \$4,315,000. The project includes a major interchange between the Nimitz Bayshore and Sign Route 17 freeways. It includes work on Sign Route 17 freeway to First Street in San Jose, and extends Bayshore Freeway to north of Brokaw Road. The work is being performed by Gordon H. Ball, Gordon H. Ball, Inc., Ball and Simpson and Lew Jones Construction Company.

Design studies are continuing on the remaining section between Sunnyvale and Brokaw Road. Completion of this 5.8-mile portion together with those portions under construction and already financed will provide a continuous freeway from San Francisco to south of San Jose.

San Jose to US 101 (Ford Road)

The last three-lane portion on the route was eliminated in 1957 by completion of a four-lane, future six-lane, freeway in the City of San Jose extending from Santa Clara Street to north of Taylor Street.

South of Santa Clara Street to Ford Road, the existing expressway has been in operation since 1947. Planning has proceeded for the eventual replacement of intersections at grade by interchanges.

US 101—El Comino Real

While not a freeway, improvements along this route justify inclusion in this article. Traffic signal and channelization projects have been completed at numerous locations. In addition, portions have been widened to

four- and six-lane, undivided and divided, conventional city street arterial standards.

A major project recently completed was a 3.9-mile widening project between San Tomas Aquino Creek in Santa Clara to State Sign Route 9 in Sunnyvale. This \$1,345,000 project was performed as a co-operative project. The Santa Clara County Flood Control District financed an estimated \$175,000 for drainage improvements desired to be constructed at the time of the highway work. Work done consisted of grading, surfacing and structures necessary to widen the highway to four 12-foot lanes with a 16-foot curbed median. The contractor on this project was A. J. Raisch Paving Company.

To be advertised shortly is a \$200,000 project for resurfacing portions of US 101 between State Sign Route 9 and Palo Alto.

Expansion of the existing highway to six lanes between Silva and Chadbourne Avenues in Millbrae was completed in November of 1958. This project which cost approximately \$111,000 also included traffic signals and lighting. The City of Millbrae completed additional work in conjunction with this project including curbs, gutters, and parking lanes.

Also under construction is a traffic signal and channelization project between Shakespeare Street and Theta Avenue in Daly City. This is a co-operative project with the City of Daly City and is being constructed by Electric Maintenance and Service Company.

US 101—Ford Road to San Benito County Line

In 1956, the three-lane width between Ford Road and Llagas Creek was expanded to a four-lane section. Included in the 1959-60 Budget are funds amounting to \$225,000 for the resurfacing of the four-lane section between Llagas Creek and Gilroy. Location studies are still underway for a freeway routing between Ford Road and south of Gilroy following land-use studies completed by the Santa Clara County Planning Department and Trafficways plan recently reported by the DeLeuw Cather and Company. Public meet-

ings will be scheduled upon completion of studies. South of Gilroy to the San Benito County line, 5.8 miles of four-lane expressway have been in operation since 1951. This section is planned for a future six-lane freeway when traffic requirements and availability of funds permit.

US 101—101 Bypass in San Francisco

Construction is now underway on the first unit of the Southern Freeway. It consists principally of an interchange with James Lick (Bayshore) Freeway at Alemany Boulevard. The City of San Francisco is contributing approximately \$1,400,000 to the cost of this \$7,629,000 project. In addition to the interchange, the project being constructed by Guy F. Atkinson includes approximately 0.5 mile of freeway to the west.

The second unit of this freeway is included in the 1959-60 Fiscal Year budget. A total of \$4,850,000 has been provided for construction westerly to Mission Street. Route location beyond this point has been determined as far as Orizaba Avenue near the south city limits.

Rights-of-way acquisition is well advanced with \$15,625,000 appropriated prior to this year. An additional \$1,900,000 was appropriated this year and \$1,500,000 is included in the 1959-60 Fiscal Year budget. Overall construction costs on the entire 4.3 miles of the State's portion of the Southern Freeway are estimated at \$18,000,000.

This freeway is intended to serve traffic in conjunction with a freeway project to the east from the James Lick (Bayshore) Freeway on a routing which is not now a part of the State Highway System.

James Lick Freeway (Boyshore)

Except for the revisions in the vicinity of Alemany Boulevard to provide connections to the Southern Freeway, James Lick (Bayshore) Freeway is completed within San Francisco. Landscaping, ground cover and erosion control work continues. A landscaping project costing approximately \$42,500 is now underway between 5th and 15th Streets.

A sum of \$100,000 is included in the 1959-60 Fiscal Year budget for

the installation of a barrier in the median between Third Street and Army Street. This is the second installation of this type on this freeway, the first unit having been installed in 1957 between 17th Street and Army Street to minimize the number and severity of spectacular accidents resulting from median crossings into opposing traffic.

Central Freeway

This freeway is a distributor to the Civic Center area of San Francisco. The first unit, a single-level elevated structure, was opened to traffic in 1955 from the James Lick Freeway, to South Van Ness Avenue. With the elevated portion of James Lick (Bayshore) Freeway, this portion is often referred to as the "San Francisco Skyway."

Nearing completion is the second unit, a 1.3-mile-long extension from South Van Ness Avenue to Turk Street. This portion is a two-level elevated viaduct over the city streets, leaving them free to handle cross-traffic movements. The \$7,725,000 project is being constructed by the Peter Kiewit Sons Company and is expected to be open to traffic in April of this year. Southbound traffic will

be carried on the three upper-level lanes and northbound traffic will be carried on the lower deck. Shoulders have been provided for emergency parking clear of the through lanes on each level of the facility. Rights-of-way acquisition has cost a total of \$8,626,000 and construction costs will approximate \$11,847,000. \$125,000 has been included in the 1959-60 Budget for landscaping between Mission Street and Turk Street.

Sign Route 17

The freeway entrance to the City of Santa Cruz between the north city limits and Mission Street was completed in December of 1956, providing much-needed traffic distribution facilities in the Santa Cruz recreational area. Seventy-five thousand dollars has been included in the 1959-60 construction program for a landscaping project on Sign Routes 1 and 17 near Santa Cruz.

Bids were opened March 4, 1959, for construction of 3.3 miles of four-lane expressway, ultimate six-lane freeway, between the completed freeway at Sign Route 1 near Santa Cruz and Carbonera Creek near Glen Canyon Road. A total of \$1,880,000 is available for the project which in-

cludes an interchange at Pasatiempo Underpass at Beulah Park and frontage roads along most of the new expressway section. This work will eliminate a section of three-lane highway. The remaining three-lane highway through Scotts Valley will be replaced by a future project now in the design stage.

From Lexington Dam to the Saratoga Avenue Interchange in Los Gatos, expressway facilities were constructed in 1956.

Construction of the 8.8-mile relocation project between the junction of the Saratoga-Los Gatos Highway in Los Gatos and Bascom Avenue in San Jose is nearly completed and may be open to traffic before the printing of this article. This project estimated to cost approximately \$5,835,000 is a four-lane, future six-lane, freeway on relocation. Alignment of this section lies approximately midway between the Santa Clara-Los Gatos Road and the San Jose-Los Gatos Road (existing Sign Route 17). Work is being performed by Gordon H. Ball, Ball and Simpson, and Lew Jones Construction Company.

The 1959-60 Fiscal Year construction program includes \$190,000 for landscaping at the Saratoga Avenue



This new high level bridge now takes US 101 traffic across Richardsan Bay in Marin County.

structed to the north of the two existing two-lane tunnels initially, then the additional lanes will allow four-lane operation in one direction during peak hours as well as permitting maintenance of the tunnels during off-peak hours without restricting traffic flow. An additional two-lane bore is contemplated for future traffic requirements.

Extending east from the portal of Broadway Tunnel, design is well advanced on a future eight-lane freeway. As an interim measure, an additional lane was added in 1956 to the westbound lanes between the tunnel and Orinda to permit normal traffic to pass slow-moving vehicles safely on this sustained grade. The Orinda Interchange has been in service since 1955.

Orinda to Arnold Industrial Freeway

Presently under construction is a six-lane ultimate eight-lane freeway between Orinda Road and 0.8 mile east of Sunnybrook Drive. This 2.1-mile project connects to the Lafayette Bypass completed in 1957. Work is being performed on this \$3,900,000 project as a joint venture by Gordon H. Ball, Gordon Ball, Inc., and Ball and Simpson. Completion is expected in September of this year. The con-

tract is a co-operative project of the Central Contra Costa Sanitary District, the County of Contra Costa and the State. Sewer work which is being done as a part of the freeway contract is being financed by the county and sanitary district at a cost of \$380,000.

Also completed in 1957 under separate contract was the Pleasant Hill Interchange, immediately east of the Lafayette Bypass. This interchange serves as a connection between the state freeway and an important county expressway to the north. It will also serve in the future as a connection southerly with the Shepherd Canyon Freeway to Oakland. The remaining portion of the freeway to Walnut Creek is now under construction and is covered under Sign Route 21. By the end of 1959 a continuous freeway will be in service from west of Orinda to north of Monument near Concord.

Design is nearly completed for extending the freeway now terminating at Monument to a connection with Arnold Industrial Freeway north of Concord.

Concord to Solana County Line

Sign Routes 24 and 4 are identical routings between their westerly junction north of Concord and Neroly

Road east of Antioch. The portion of the freeway between Willow Pass Road to A Street in Antioch was completed in 1952. From A Street to Neroly Road and thence to the Sacramento county line via the Antioch Bridge the route has been adopted and declared a freeway. Design studies are well advanced. East of Neroly Road to the San Joaquin county line the status of development is discussed under Sign Route 4.

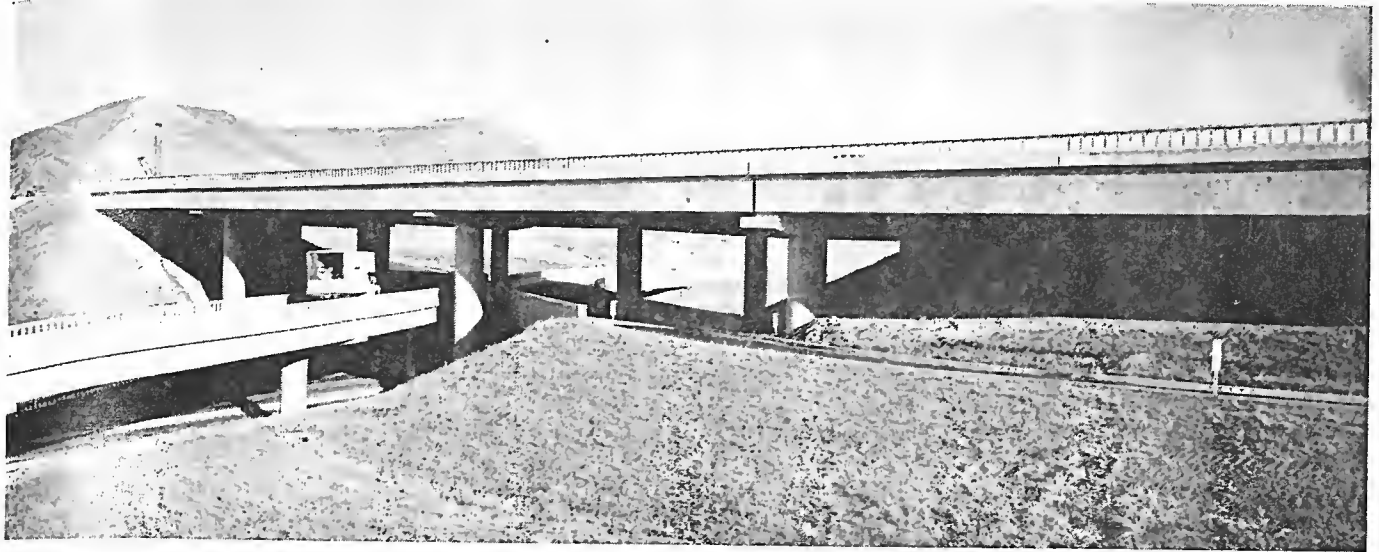
Embarcadero Freeway

The last portion of this multilane elevated freeway for which a routing has been determined was opened to traffic in February of this year. Freeway service is now provided from the on and off ramps at Broadway and Sansome Streets, to the Skyway as well as to the San Francisco-Oakland Bay Bridge. This 1.2-mile section cost approximately \$7,627,000, and work was performed by Charles L. Harney, Inc. Included in the work was extensive reconstruction work required to relocate portions of both the State Belt and Southern Pacific Railroad tracks on the Embarcadero under the freeway.

Construction was started on the first of the three projects for this freeway in May of 1955 by MacDonald,



The Morrissey Avenue interchange in Santa Cruz. Beyond are the ramps connecting Sign Route 17 with Sign Route 1.



The three-level interchange near Hercules where two freeways meet. Top level is US 40; bottom level is the Arnold Industrial Freeway; middle level is for onramps to US 40.

Young and Nelson, Inc., and Morrison-Knudsen. The entire facility, 1.5 miles in length, has cost approximately \$14,862,000 for construction and \$11,720,000 has been expended or budgeted for rights-of-way acquisition.

Junipero Serra Freeway

On July 23, 1958, the Highway Commission adopted the route for the portion of Junipero Serra Freeway in San Mateo and Santa Clara Counties between San Bruno Avenue near the end of the existing Junipero Serra Boulevard and Saratoga Avenue southwest of Santa Clara. State Highway Route 239 as designated by the State Legislature in February, 1957, has now been entirely adopted from US 101 south of Ford Road near San Jose to San Bruno Avenue. The cost of the initial development is estimated at approximately \$74,000,000 including rights-of-way. The portion of this freeway north of San Jose is a part of the Interstate Highway System, approximately 90 percent of which will be financed from federal funds. Design is being expedited on this very important route and numerous construction projects are anticipated. Extensive rights-of-way acquisition cannot commence until detailed design studies have progressed and freeway agreements reached with local authorities. It is expected that the first construction project, the

limits of which are not known at this time, may not be under way for several years.

From San Bruno Avenue north to the present intersection with Sign Route 1 in Daly City, the existing expressway is designated as State Highway Route 237. It was constructed by Joint Highway District No. 10 which was dissolved by the Legislature in July of 1956 and taken into the State Highway System at that time. Studies are presently under way for possible freeway relocation between San Bruno Avenue and the San Francisco county line. Initial public meetings have been held and further studies are being made prior to other hearings leading to route adoption.

Sign Route 1 (Cabrillo Highway)

This route has been developed as an expressway between Edgemar Road in Daly City to Lake Merced Boulevard in San Francisco. This 4.6-mile expressway was completed in 1956 and the northerly portion from the south city limits of San Francisco to Lake Merced Boulevard was constructed by the City of San Francisco.

A \$1,391,000 project was completed in 1958 between Edgemar in Pacifica and Skyline Boulevard at Edgemar Road in Daly City. This 2.2-mile, four-lane expressway bypassed the section of two-lane coastal road

along Thornton Bluffs south of San Francisco. Maintenance of traffic due to wet weather slides had been difficult and costly on the old coastal road. Contractor was McCammon-Wunderlich and the Wunderlich Contracting Company.

A route was adopted on January 22, 1958, extending this expressway southerly to Pedro Valley in Pacifica and design studies are under way. Relocation studies for the Devil's Slide area are well advanced and preliminary meetings have been held.

In the vicinity of Santa Cruz the 2.1-mile initial four-lane, future six-lane freeway between the junction of Sign Routes 1 and 17 to 0.3 mile east of Morrissey Avenue was completed in November of 1958. The construction was performed as a joint venture by Dan Caputo and Dan Caputo and Edward Keeble. Also completed last fall were the initial two lanes of the future four-lane expressway on new alignment between Swift Street in Santa Cruz and Wilder Creek north of the city limits. This project was jointly financed by the State and Joint Highway District No. 9 with the State contributing \$419,000 to the cost. The contractor was Granite Construction Company. From Wilder Creek to four miles south of Davenport plans are complete for the initial two lanes of a future four-lane, limited-access freeway. Seven hundred



Expressway construction on the Block Point Cutoff (Sign Route 37) with the new bridge across Petoluma Creek in the upper center and the Atherton Avenue interchange in the foreground.

thousand dollars is included in the 1959-60 Fiscal Year program for this project which will be under construction this summer.

South of Santa Cruz, an expressway has been in operation to Rob Roy Junction for some time. Design studies are now in progress to convert this portion to a full freeway. Studies are also being made to expand the existing three-lane highway between Rob Roy Junction and Watsonville. South of Watsonville to the Monterey county line, the route has been adopted and design is well advanced for a four-lane, ultimate six-lane freeway facility.

19th Avenue Freeway (San Mateo)

In March, 1957, the State Highway Commission adopted the route for this freeway extending from Sign Route 5 (Skyline Boulevard) west of San Mateo, to the Alameda county line, a distance totaling 7.2 miles. Design studies on this four-lane facility are well advanced and rights-of-way acquisitions are in progress. This freeway will connect to the route adopted in Alameda County from the county

line to the Nimitz Freeway by action of the Highway Commission in 1952. It is anticipated that construction will begin as soon as availability of funds and priority of other worthwhile projects will permit. The Division of Bay Toll Crossings has recently completed a report of preliminary studies of expanding the San Mateo Bridge and approaches to freeway standards.

Pacheco Pass

Since 1951, a four-lane freeway has been in use on Sign Route 152 over Pacheco Pass. Advance planning studies are being made to extend this facility westerly to San Felipe.

Stevens Creek Freeway

The route has been adopted for this important cross-country freeway from Sign Route 17 in Los Gatos to the Bayshore Freeway near Mountain View and design studies are in progress. The southerly portion will be initially constructed as a four-lane facility and rights of way will be purchased for future eight lanes between the Junipero Serra Freeway in

Cupertino and the Monterey Highway near Ford Road. From Junipero Serra to Bayshore Freeway (US 101 Bypass) an initial four-lane, ultimate six-lane project is being designed.

Mountain View-Milpitas Area

The location of State Sign Route 9 from Bayshore Freeway to Nimitz Freeway was adopted in December of 1954. From El Camino Real to Bayshore Freeway the route was adopted in September, 1958. Two lanes of the future Alviso Bypass Freeway have been in operation since 1957 on the portion between Lawrence Station Road east of Bayshore Freeway and the San Jose - Alviso Road east of Alviso. The 2.5-mile widening project between Lawrence Station Road and Bayshore Freeway was completed in August of 1958 by Edward Keeble, contractor. East of Alviso, design studies are well advanced for realignment in the vicinity of Coyote Creek.

Route 228—Nimitz Freeway to US 50

This important four-lane freeway was completed in September, 1956, and provides a connection from the Nimitz Freeway in the vicinity of Lewelling Boulevard to US 50 in Castro Valley, thus providing continuous freeway or expressway facilities between the Bay Bridge and Tracy in San Joaquin County. A landscaping contract was completed on this portion in October of 1958.

Webster Street Tube

The plans have been completed for a parallel two-lane tube and approaches between Oakland and Alameda and it is expected that this project will be advertised this spring. The new tube will be constructed generally parallel to and a short distance westerly of the existing two-lane Posey Tube. The tube will be 3,350 feet long and together with approaches amounts to a 1.1-mile project. Construction of the parallel tube and the Alameda and Oakland approaches will be accomplished in one contract and upon completion of this work, the new tube will be placed into operation and the existing Posey Tube will be closed for rehabilitation

... Continued on page 52

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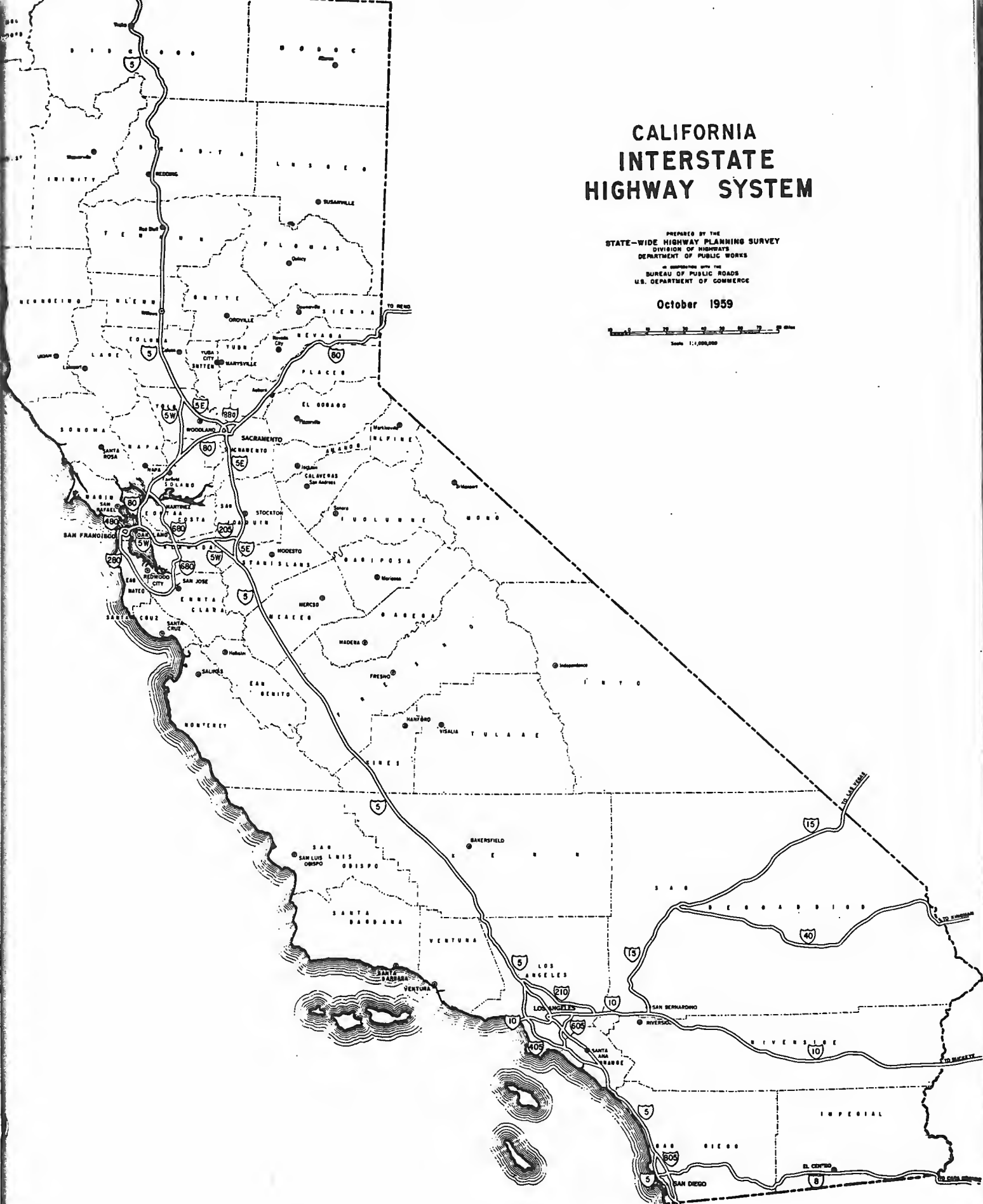
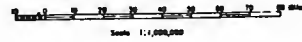
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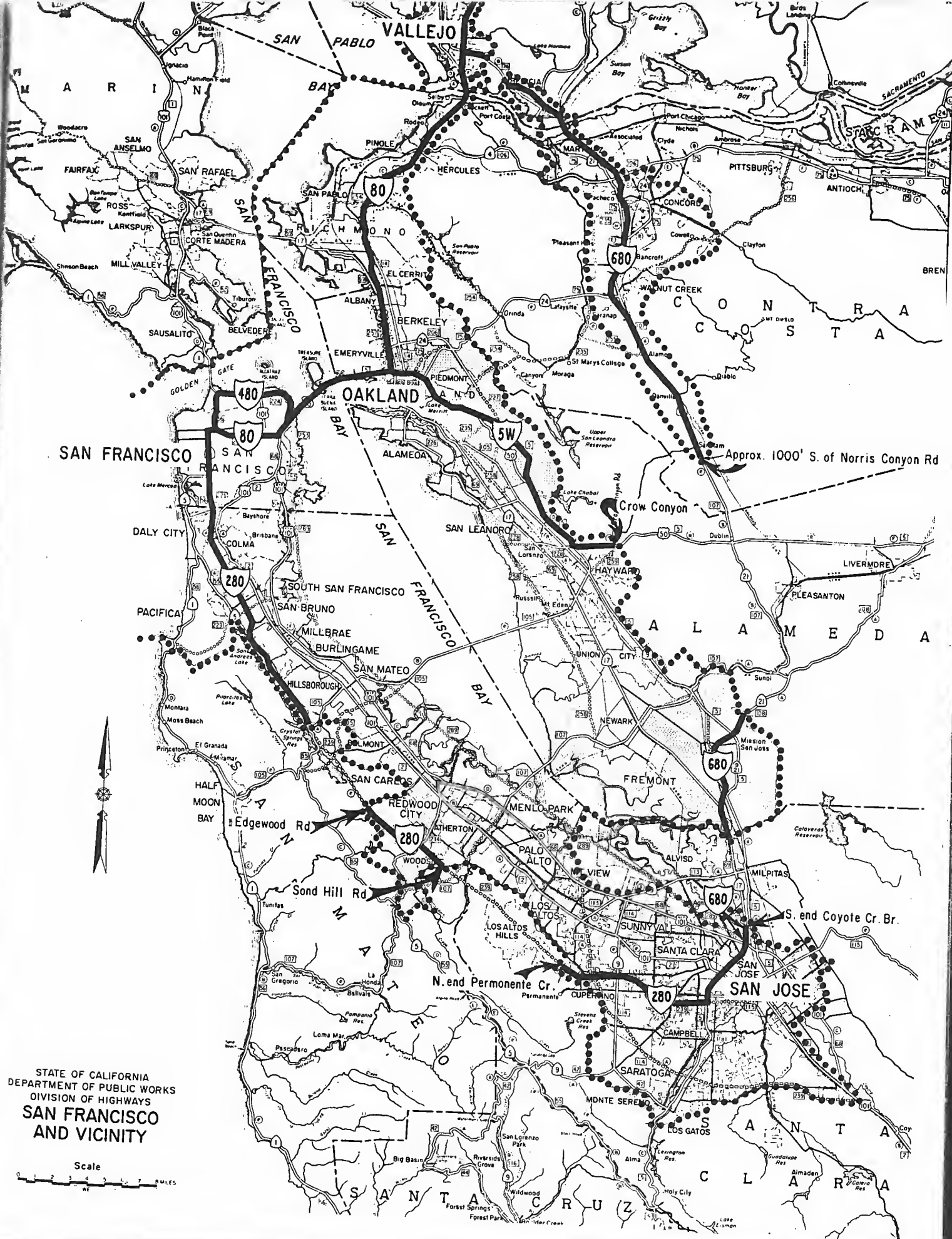
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October 1959





Freeways in District IV

By J. P. SINCLAIR, Assistant State Highway Engineer

THE "FABULOUS FIFTIES" have brought great advancements in modern freeway construction in the San Francisco Bay area. During the decade, a total of 300 miles of freeway have been completed in the nine counties comprising District IV.

However, the fifties have also seen a tremendous growth in population and vehicle registration. In 1950, the nine counties had a population of 2,643,000 with 1,102,000 vehicles. At the end of 1959, the population had grown to 3,648,000, an increase of over a million people. Vehicle registration has spurred to 1,786,000. Traffic throughout the district has nearly doubled.



J. P. SINCLAIR

Some of the comparative average daily vehicle counts are as follows:

Location	Number of Vehicles	
	1950	1960
Eastshore (Ashby Avenue).....	46,000	83,000
S.F.-Oakland Bay Bridge	80,000	104,000
Golden Gate Bridge	26,000	50,000
Bayshore (South San Francisco)	29,000	75,000
US 50 (Dublin)	8,000	17,000

The total expenditures on freeways in District IV in the last 10 years is approximately \$600,000,000. The district's total construction and right-of-way budget was \$19,000,000 in 1950 and has increased to \$80,000,000 this past year. This is a measure of the acceleration in the freeway program.

During this 10-year period, the Nimitz Freeway from Oakland to San Jose has been completed.

Sign Route 17 Freeway from San Jose to Los Gatos will be finished this summer.

US 40, the interstate route from the Bay Bridge to Carquinez, is all full freeway except the one link from El

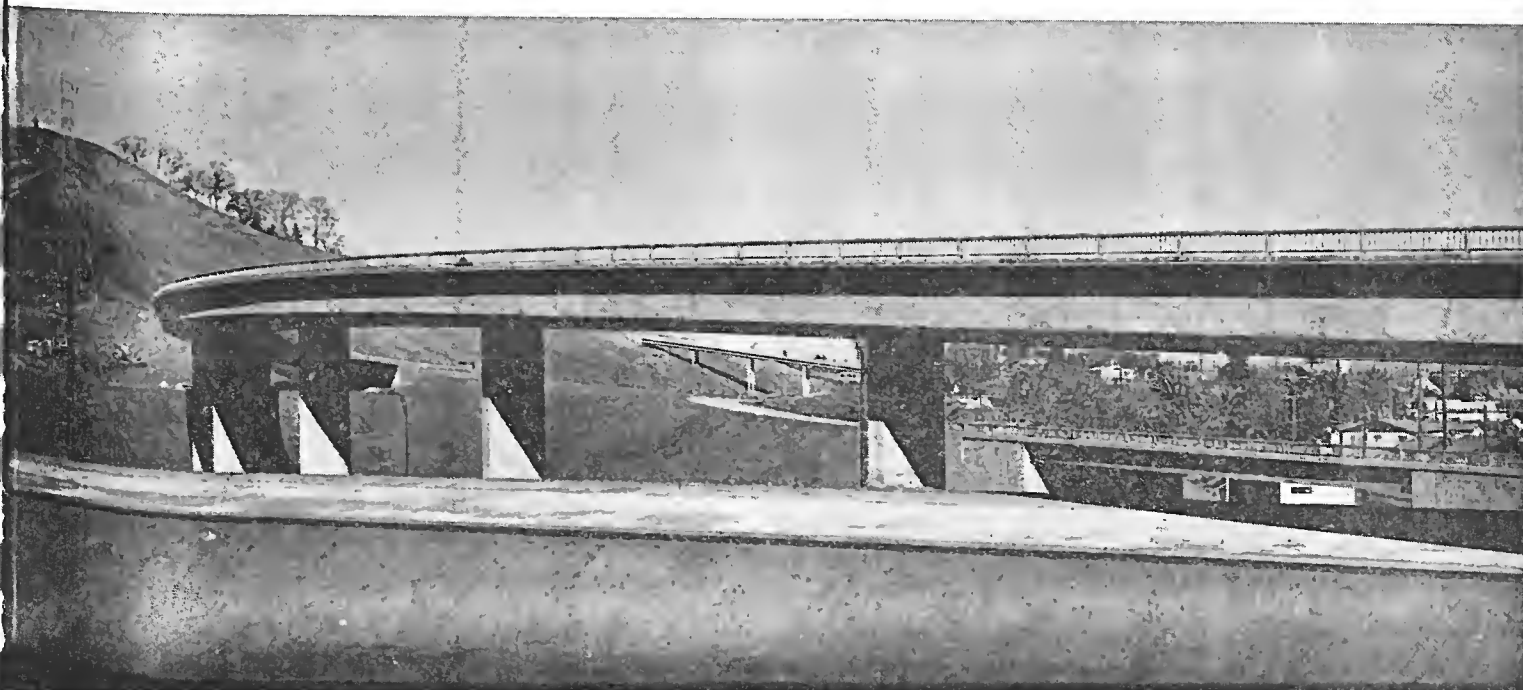
Cerrito Overhead to Richmond, which is under construction and scheduled for completion this spring.

The last unit of the freeway on Sign Route 24 between Orinda and the Monument will be completed this spring while the project east of Orinda through Charles Hill to the Lafayette Bypass was opened to traffic last November.

This year, the last two projects to make the Bayshore a continuous freeway from San Jose to San Francisco are being advertised.

US 101 north of the Golden Gate Bridge is a divided highway through Santa Rosa, with the section to San Rafael completed as a full freeway last summer. Design is under way for converting the expressway to full freeway from San Rafael to Petaluma, and the first construction project at Freitas Parkway has commenced. Other projects are being constructed or budgeted for a full freeway on the Healdsburg Bypass and a section from Santa Rosa to Windsor. Planning activities have

Photo below—Ground view of the Walnut Creek "Y" Interchange. Branch connection structure from SSR 24 to SSR 21 in immediate foreground.



resulted in the adoption of the last unit of a freeway route north of Lytton which provides a freeway location all the way from San Francisco to the Mendocino county line.

Design work has started on the Junipero Serra Freeway, an interstate route from San Bruno to San Jose, and three fourths of the cities have signed freeway agreements. Routes have been determined for all other sections of the interstate system in the district except the portion in San Francisco and Daly City. Planning activities have started on several of the new freeway locations designated in Senate Bill No. 480.

A more detailed review of construction highlights and future plans for freeway development in District IV follows:

US 40—San Francisco to Carquinez Bridge

A 2.3-mile project presently under construction between south of El Cerrito Overhead and Jefferson Avenue is the last link of freeway on US 40 between San Francisco and Vallejo. Estimated to cost approximately \$5,583,000, it is being performed as a joint venture by Piombo Construction Company, M&K Corporation and Connolly Pacific Company. Completion in June of this year is anticipated for this six-lane freeway project which includes three interchanges: a direct connection at Hoffman Boulevard to State Sign Route 17, and diamonds at Central Avenue and Carlson Boulevard. A more detailed account of this project will appear in the May-June issue of *California Highways and Public Works*.

An eight-lane freeway is already in operation from the distribution structure at the east end of the San Francisco-Oakland Bay Bridge to the El Cerrito Overhead. Also previously completed is a six-lane freeway to the Carquinez Bridge which included the eight and one-half million cubic yard "Big Cut" which is approximately 0.6 mile long, a quarter mile wide at the top, and 300 feet deep. Three contracts completed the approaches to and erection of the parallel Carquinez Bridge, opened to traffic in November 1958.

Temporary connections were provided at each end of the new bridge

to permit two-way traffic so that the old bridge could be modified and the Crockett approach ramp could be constructed. This project, costing approximately \$1,315,000, was completed in April of 1959 and provides for three lanes of southbound traffic on the old bridge and four lanes northbound on the new. Rothschild, Raffin and Weirick performed this work.

Construction of US 40 north of Arnold Industrial Highway (State Sign Route 4) was financed from revenue bonds as part of the Carquinez Bridge project. Another major US 40 project being financed by toll bridge funds is the reconstruction of the approach ramps to the double-decked Bay Bridge so that five lanes of one-way westbound traffic will be carried on the upper level with eastbound traffic on the lower deck. This work is being administered by the Division of San Francisco Bay Toll Crossings. Toll bridge funds also provide for the widening of the south side of the Bay Bridge Toll Plaza. This work, expected to start shortly, will be done in conjunction with remodeling and increasing the number of the toll booths. Faster collection for Oakland-bound traffic will be made from the driver's side of the vehicle and truck tolls by weight will be superseded by axle count tolls to save time.

During 1959, landscaping was completed on the constructed portions of the freeway south of El Cerrito Overhead and north of San Pablo Avenue to Ridge Road. Funds in the amount of \$280,000 have been provided in the 1960-61 fiscal year budget for landscaping between 0.3 mile south of El Cerrito Overhead to 0.3 mile south of Jefferson Avenue which will be advertised for bids this spring. An additional \$130,000 has been provided for landscaping on which work is now starting from the Port of Oakland Overhead on the San Francisco-Oakland Bay Bridge approaches to the distribution structure. A small planting project is underway between Ridge Road and Crockett.

US 50—Bay Bridge to Castro Valley

Work has started on the first unit of the MacArthur Freeway which will ultimately provide an eight-lane in-

terstate facility from the Bay Bridge Distribution Structure in Oakland to Castro Valley. A total of \$23,000,000 has been included in the 1959-60 and the 1960-61 budgets for the construction of four projects comprising the 3.9-mile section between the distribution structure and 14th Avenue in Oakland. Right-of-way is nearly all acquired.

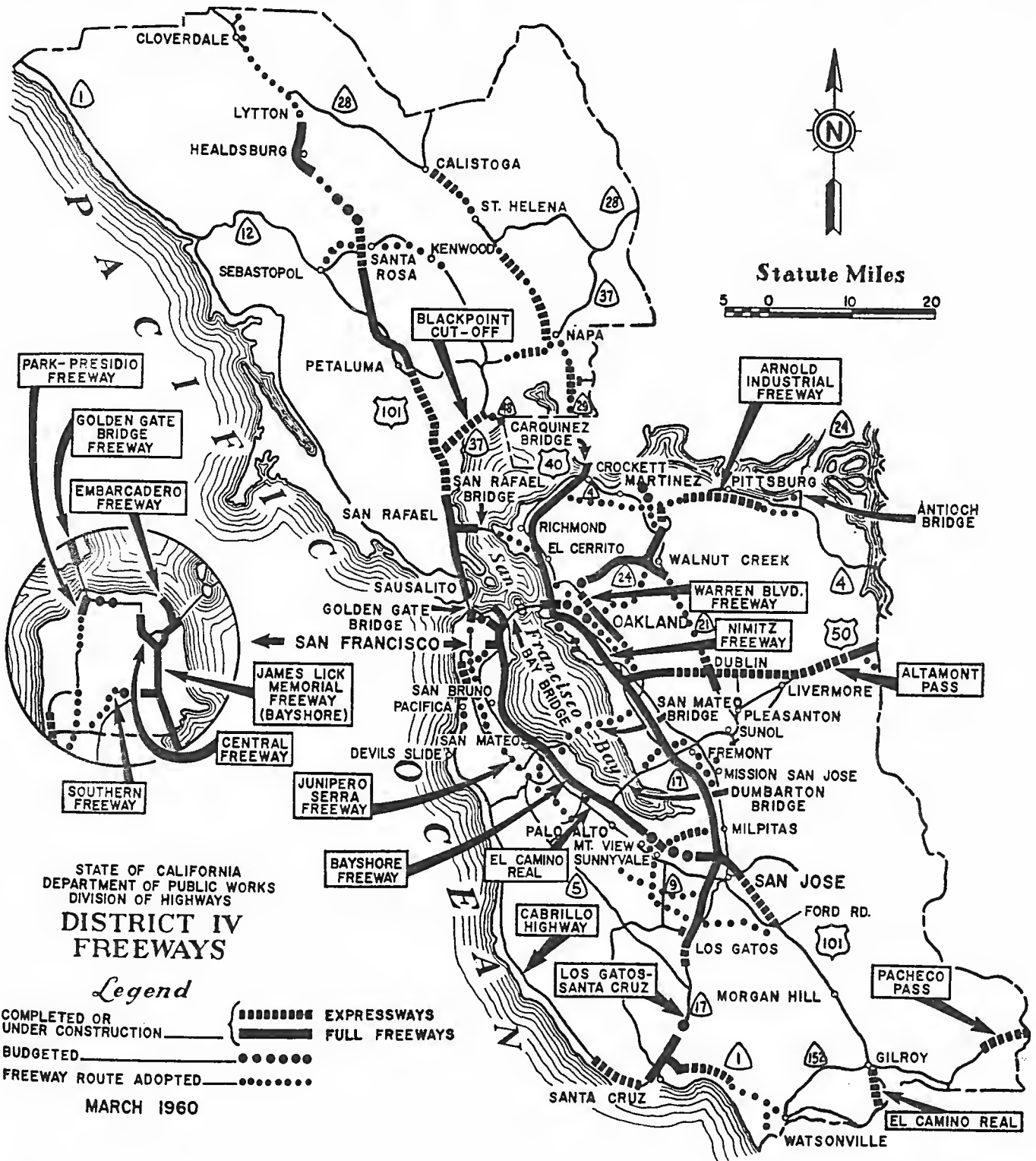
The usual design problems occasioned by intersecting freeways have been further complicated at the intersection of the MacArthur and Grove-Shafter Freeways by the recently proposed inclusion of the rapid transit facilities in the Grove-Shafter median. Studies by the Bay Area Rapid Transit Commission are not yet complete, nor is financing certain. However, bridge superstructures will be deferred and construction staged so that the much-needed MacArthur projects will get underway on schedule and will include all features necessary to the proper handling of US 50 traffic. These alterations will avoid extensive revisions to accommodate possible rapid transit requirements in the Grove-Shafter Freeway.

A more detailed article covering the planning, design and right-of-way aspects of the MacArthur Freeway, as well as the limits and funds of budgeted projects, is contained elsewhere in this issue.

US 50—Castro Valley to San Joaquin County Line

Portions of the Nimitz Freeway (State Sign Route 17), Route 228 easterly to Castro Valley and US 50 easterly have provided a continuous freeway from Oakland to Dublin, since the 1957 completion of a four-lane facility between Castro Valley and 2.3 miles west of Dublin. To the east of Dublin, US 50 is presently an expressway with a controlled number of intersections at grade.

Construction activities in this area during the past year have been limited to landscaping, resurfacing, and minor projects. Among these is a landscaping project to be completed soon between Center Street in Castro Valley and the Nimitz Freeway, and a seven-mile resurfacing project east of Livermore which was completed in July of 1959. The latter work was



done by A. Teichert and Son at a cost of \$135,400.

Studies have continued for the development of the existing expressway east of Dublin to full freeway standards. Aerial mapping is underway for

preparation of plans for an initial six-lane, ultimate eight-lane freeway between Dublin and Greenville. Planning studies are being made on the portion of this route between Greenville and 1.5 miles east of the Alameda-

San Joaquin County Line to meet Federal Interstate requirements.

US 101—Golden Gate Bridge to San Rafael

The year 1959 saw continued progress towards the development of a full

freeway on the Redwood Highway (US 101) north of the Golden Gate Bridge.

Prior construction provided a six-lane freeway from the bridge to Greenbrae. A northbound freeway structure and ramps at the Greenbrae Interchange were completed last October at a cost of \$1,780,000.

Bids on the final stage of construction at Greenbrae Interchange are scheduled to be opened late in April. It is estimated to cost approximately \$1,240,000 and will create a three level separation providing both left and right turn ramps for northbound freeway traffic. The old bridge with a lift span across Corte Madera Creek will be removed.

Previous projects northerly completed a six-lane freeway to the San Rafael Viaduct.

Funds in the amount of \$54,500 were provided in the 1959-60 budget for landscaping US 101 between the Richardson Bay Bridge and Corte Madera Creek. This work which includes the planting of redwood trees is presently underway.

Studies are now in progress for expansion to an eight-lane freeway from San Quentin Wye to Porto Suello Hill, north of San Rafael, including expansion of the present four-lane San Rafael Viaduct.

US 101—San Rafael to Petaluma

This section had been previously developed as an expressway with intersections at grade. The first project to convert to six-lane full freeway standards at the Freitas Parkway intersection was awarded to Frederickson and Watson Construction Company. The \$1,250,000 contract scheduled for completion in November includes a trumpet type interchange, frontage roads and a partial interchange at San Pedro Road near the new Marin County Civic Center.

Design studies are proceeding on a six-lane, freeway from 0.6 mile north of Forbes Overhead to north of Atherton Avenue in Novato. Future construction projects will include a partial interchange at Miller Creek Road, an added northbound uphill lane to relieve congestion on a sustained grade, and an interchange at Ignacio Wye at the intersection of US 101 and State

Sign Route 37 as soon as construction funds are made available.

US 101—Petaluma to Mendocino County Line

An 18.5-mile section of freeway from south of Petaluma to the southerly city limits of Santa Rosa was completed in 1957 after a series of five construction projects. Design studies are underway for a \$3,000,000 conversion of the existing expressway through the City of Santa Rosa to the initial four lanes of an ultimate six-lane freeway.

Funds have been provided in the 1960-61 construction program for a 9.2-mile four-lane freeway northerly from Mendocino Avenue in Santa Rosa to Grant Creek. This \$5,200,000 project which includes five interchanges, provides for construction of the freeway between Santa Rosa and Windsor and for grading between Windsor and Grant Creek. Design is nearly completed for drainage, bridges, base and surfacing on the latter portion although this estimated \$3,800,000 project has not yet been budgeted for construction.

North of Grant School, a 1.2-mile portion of the Healdsburg Bypass south of the city was completed in May of 1959. This \$1,629,000 project also included twin bridges over the Russian River, partial construction of interchanges at Grant Avenue and South Healdsburg, and accomplished 3.7 miles of rough grading for the freeway to the north.

The current phase of construction which will complete the bypass to a connection with the existing highway at Lytton was awarded to Guy F. Atkinson. This 4.1-mile \$2,700,000 project includes interchanges at Dry Creek and Guerneville Roads as well as three other bridges and undercrossings. It is expected that construction will be completed late this summer.

From Lytton to Mendocino county line, the route has been adopted and a four-lane expressway providing for development to a six-lane freeway is being designed.

Planting of redwood trees on portions of the freeway between the Petaluma Creek Bridge and Santa Rosa was accomplished last year. This work, costing approximately \$14,500, was performed by Shawn Company.

The 1960-61 construction program provides \$100,000 for landscaping on 0.8-mile portion of the freeway between Lynch Creek and the south city limits of Petaluma. Bids will probably be advertised this summer.

US 101 (Bypass)—San Francisco to Palo Alto

Previous projects on the Bayshore have provided a continuous six-lane freeway from the south city limits of San Francisco to Palo Alto, a total distance of 26 miles. Included in these projects were four contracts totaling \$7,710,000 for the "open water fill" across an arm of the San Francisco Bay, between Sierra Point and Candlestick Point. This section saved 0.4-mile distance and reduced commute hour travel time by approximately 20 minutes.

Heavy, congested traffic on this freeway near the San Francisco International Airport led to the inclusion of \$1,900,000 in the 1959-60 budget for widening the freeway to eight lanes from Broadway in Burlingame to San Bruno Avenue in San Bruno. This 7.5-mile project, to be advertised this spring, will include the addition of a direct right-turn ramp to the southbound freeway lanes and improvement of other ramp outlets at the Millbrae Avenue Interchange. An additional northbound lane is included between Broadway and Peninsular Avenue. A double metal beam barrier will be provided between the opposing traffic lanes through these areas.

Improvements north of Palo Alto during the past year have included landscaping and minor interchange revision. A 2.2-mile, \$82,000 landscaping project between Peninsular Avenue and 16th Avenue in San Mateo was completed in April of 1959, and consisted of planting trees, shrubs, and ground cover. Also completed in April was the Norfolk Street connection to the East Hillsdale Boulevard Interchange at a cost of approximately \$59,700.

Presently under way is a \$220,000 landscaping project at Willow Road and University Avenue Interchanges. Included in the 1960-61 budget is \$180,000 for landscaping the completed freeway between 16th Avenue in San Mateo and Harbor Boulevard.



Looking southwest over the Crockett Interchange from the Carquinez Bridge, through the "big cut."

US 101 (Bypass)—Palo Alto to San Jose

Funds in the 1959-60 and 1960-61 budgets provide for construction of the last two links in the continuous Bayshore Freeway between San Francisco and San Jose. Several other contracts are currently under way and an important interchange was completed this past year.

The interchange at the intersection of Bayshore Freeway and Sign Route 9 was completed in July. This \$1,257,000 project, including an overpass carrying Mountain View-Alviso traffic over the Bayshore and short sections of six- and four-lane freeway, was constructed by Dan Caputo and M.J.B. Construction Company as a joint venture.

Virtually completed is the 4.4-mile freeway extension from the San Mateo county line to Stierlin Road. This six-lane facility is being constructed by L. C. Smith and Concar Ranch and

Enterprises at a cost of approximately \$3,465,000. It will provide interchanges at Embarcadero and San Antonio Roads and a partial interchange at Middlefield Road.

In San Jose a 4.1-mile freeway section from Brokaw Road to Taylor Street is under construction. This project includes four interchanges and a total of 13 structures. A major interchange is provided at the intersection of Nimitz, Bayshore and Sign Route 17 Freeways. Also included in this \$4,315,000 project is the extension of State Sign Route 17 as a freeway to First Street in San Jose.

One of the two remaining gaps in the freeway is scheduled for advertisement this spring and will extend Bayshore Freeway from Charleston Road in Mountain View to the Guadalupe River near San Jose. This \$5,050,000 project also includes work on the Mountain View-Alviso Road (State Sign Route 9) from Bayshore to 0.2

mile east of Borregas Avenue. Another feature is the alteration of existing channel facilities of the Santa Clara County Flood Control District including the Guadalupe River realignment. The Flood Control District is participating in the cost of the project.

The last remaining section of the freeway between Brokaw Road in San Jose and Morse Avenue in Sunnyvale is included in the 1960-61 budget. This 6.1-mile project will consist of a four-lane facility between Brokaw Road and Guadalupe Parkway, and six lanes from there to Morse Avenue. Cloverleaf interchanges will be provided at Fair Oaks Avenue, Lawrence Station Road, San Tomas Aquinas Boulevard and De La Cruz Boulevard. This project will complete the freeway between San Francisco and San Jose, costing approximately \$5,760,000, and it is expected to be advertised this spring.

US 101 (Bypass)—San Jose to US 101 at Ford Road

Design studies are underway for conversion of the existing expressway to freeway standards from Santa Clara Street to Ford Road. The expressway has been in operation since 1947.

North of Santa Clara Street the last three-lane portion of this route was eliminated in 1957 by the completion of 1.3 miles of freeway to north of Taylor Street in San Jose.

Funds in the amount of \$100,000 are in the 1960-61 budget for landscaping this section.

US 101—Ford Road to San Benito County Line

Studies have been completed and a public meeting will be held in the near future on the proposed freeway routing between Ford Road and south of Gilroy. These studies are the culmination of several years of work by the division and the Santa Clara County Planning Department.

South of Gilroy, 5.8 miles of expressway have been in operation to the San Benito county line since 1951. Full freeway development within these limits is dependent upon traffic requirements and availability of funds.

A \$119,200 resurfacing project between Llagas Creek and Gilroy was completed in August. Drainage improvements were constructed in Morgan Hill as a co-operative project with that city.

US 101—El Camino Real

Although not a freeway, this historic route plays an important role in serving the communities of the Peninsula between San Jose and San Francisco. Major portions have been and are being widened to four and six lanes with some median separation. In co-operation with the many cities, traffic signal and channelization projects have been completed and others are being planned.

A \$1,345,000 project was completed in 1959 which provided 3.9 miles of divided highway between San Tomas Aquinas Creek in Santa Clara and State Sign Route 9 in Sunnyvale. The Santa Clara County Flood Control District participated.

Design studies are underway for widening El Camino Real to a six-



Boyshore Freeway along peninsula south of San Francisco. Willow Road Interchange in Palo Alto in center foreground with University Avenue Overcrossing in upper left; looking south.



Looking westerly across the University Avenue Interchange on Boyshore Freeway in the City of Palo Alto.



Looking southerly at the site of construction for interchange facilities between Sign Route 17 and US 101 Bypass (Bayshore) near San Jose. Old Bayshore Highway Intersection in foreground, new Nimitz-Bayshore Interchange in center.

lane divided highway between Taylor Boulevard in Millbrae and Old Mission Road in Colma. Similar projects are being studied in Palo Alto between University Avenue and Matadero Creek, and a four-lane divided arterial is under design study between Ford Road and South Tully Road.

The widening to an ultimate six-lane divided section of the portion of El Camino Real between Palo Alto and San Jose is under study, and public hearings have recently been held to discuss the plan.

US 101 in San Francisco

Nearing completion is the first unit of the Southern Freeway. This construction will provide a direct connection interchange for the intersection of the Southern and James Lick Memorial Freeways at Alemany Boulevard. In addition to the interchange connections, the project required relocation of Bayshore Boulevard, reconstruction of ramp facilities at the Alemany Boulevard interchange on James Lick Memorial Freeway, and rough grading for a portion of the eight-lane Southern Freeway. This work by the Guy F. Atkinson Company scheduled

for completion this spring will cost approximately \$8,100,000, and of this amount, \$1,450,000 has been contributed by the City of San Francisco.

To be advertised probably this summer is the second unit of this freeway, for which \$4,995,000 has been included in the 1959-60 budget. This 1.4-mile project provides for building six lanes of the ultimate eight-lane freeway from the James Lick Memorial interchange westerly to Milton Avenue.

Design studies for the next 1.3-mile portion between Ocean Avenue and Mission Street are well advanced. Right-of-way acquisition is nearly completed and \$6,000,000 has been provided in the 1960-61 budget for construction. The route for the Southern Freeway has been adopted as far as Orizaba Avenue near the south city limits of San Francisco.

The full value of the Southern Freeway will be greatly enhanced when its extension easterly and northerly to the Embarcadero Freeway is completed. This connection was added to the State Highway System in 1959 as Route 253. A section has been adopted and construction may proceed as soon

as right-of-way is acquired by the city under terms of the legislative act adding this new route to the system.

James Lick Memorial Freeway (US 101)

A six- and eight-lane freeway has been in service since 1956 from the county line near Third Street to the San Francisco-Oakland Bay Bridge. This skyway is used by approximately 125,000 vehicles daily and affords motorists a panoramic view of San Francisco. Work in the past few years, except for the revisions necessitated by construction of the direct connections to the Southern Freeway, has consisted of landscaping, erosion control, and installation of barriers to prevent disastrous median crossing accidents.

The Chicago Fence and Equipment Company is presently constructing a median barrier on portions of the section between south of Third Street and Army Street. This 1.4-mile installation consists of back-to-back steel guard rails and will cost approximately \$74,000. It extends the barrier completed in 1958 between 17th Street and Army Street. Since the first installation, there have been no median crossing accidents and the number and severity of all accidents in this area have declined noticeably.

The gap left in the present barrier contract, within the limits of the interchange project now under way, will be closed by a separate contract.

A landscaping project between Fifth Street and 17th Street was completed during the past year by Watkins and Sibbald at a cost of \$38,000.

Central Freeway

In April of 1959, the second unit of this distributor facility to the Civic Center area of San Francisco was opened to traffic. It extends the elevated six-lane section of divided freeway between the James Lick Memorial Freeway and South Van Ness Avenue by means of a two-level elevated structure to Turk Street.

The extension provides off ramps to the intersections of Fell and Laguna Streets and to Franklin and Golden Gate. On ramps were provided for traffic from Oak and Laguna and Turk and Gough. The viaduct, carrying southbound traffic on the upper

deck and northbound traffic on the lower deck, leaves the city streets below free to handle the heavy cross-traffic movements. The contractor on this \$7,800,000 project was Peter Kiewit Sons' Company.

Approximately \$450,000 has been provided in the 1960-61 budget for landscaping and paving parking areas along the Central and James Lick Memorial Freeways. Presently there are two such projects in progress; a \$46,000 contract being performed at nine locations on the Central, James Lick and Embarcadero Freeways by Charles L. Harney, Inc., and a \$72,000 project for paving parking lots between Mission Street and Turk Street. The contractor on the latter project is O. C. Jones and Sons.

Embarcadero Freeway

This 1.5-mile elevated facility providing traffic service from the Bay Bridge and James Lick Memorial Freeway was constructed in three projects starting in April of 1955. The last project was completed in March of 1959 at a cost of approximately \$7,627,000 for 1.2 miles of double-deck elevated viaduct. Ramps were provided at Broadway. Extensive reconstruction work was required to relocate portions of the Southern Pacific Railroad and State Belt tracks under the freeway along the Embarcadero. A \$12,000 landscaping project between Front and Sansome Streets is underway.

Studies are now underway for the location of Route 253 which was added to the state highway system by the 1959 Session of the Legislature. This will provide an extension of the Embarcadero Freeway southerly to the vicinity of Army Street and thence westerly to a connection with the Southern Freeway at James Lick Memorial Freeway. A Hunter's Point leg connecting near Army Street will extend southerly to the Bayshore Freeway near the south city limits. Public meetings will be held upon completion of the studies.

Sign Route 17

This highway links the metropolitan communities of the Bay area with the recreational facilities of the Santa Cruz area. Two projects presently

under construction, estimated for July completion, will provide 75 miles of continuous freeway via Sign Route 17 from south of Los Gatos to Oakland, thence along US 40 to Vallejo.

One of these projects, two and one-half miles of initial four-lane, ultimate six-lane freeway, is being constructed between Bascom Avenue and North Fourth Street in San Jose at a



Looking east along Sign Route 24 toward Mt. Diablo with Acolones Valley Road Interchange in foreground.

islature in 1952. The bridge is presently under construction and is expected to be completed in the summer of 1962. A high level structure, west of the existing Southern Pacific Railroad Bridge, will cost approximately \$14,240,000. To be advertised this summer are the approaches between the bridge and Arnold Industrial Highway (State Sign Route 4).

Funds in the amount of \$350,000 have been provided in the 1960-61 Budget for landscaping the project presently under construction near Walnut Creek.

Sign Route 24

Beginning at Ashby Avenue Interchange on US 40 (Eastshore Freeway) in Berkeley, Sign Route 24 proceeds easterly through the Broadway Tunnel to Walnut Creek, Concord, Antioch and northerly points via the Antioch Bridge.

\$10,000,000 is provided in the 1960-61 budget for an additional two-lane bore to be constructed to the north of the two existing two-lane tunnels. Completion of this project for which bids will be advertised this summer will allow four-lane operation in one direction during peak hours and permit tunnel maintenance without restricting traffic flow during off peak hours. Easterly of the east portal to the completed freeway near Orinda, design is under way for an eight-lane freeway. This 1.6-mile section is expected to cost approximately \$5,000,000.

Orinda to Arnold Industrial Freeway

East of the Orinda interchange which has been in service since 1955, a 2.1-mile project was recently completed. This \$4,380,000 contract provides a six-lane freeway between Orinda Road to 0.8 miles east of Sunnybrook Drive. The work, performed as a joint venture by Gordon H. Ball, Gordon Ball, Inc. and Ball and Simpson includes a diamond interchange at Charles Hill Road and a four-quadrant cloverleaf at Acalanes Valley Road. It involved co-operative work with Contra Costa County and the Central Contra Costa Sanitary District.

This project connects to the Lafayette Bypass which was completed in

1957. Immediately to the east of the Bypass is the Pleasant Hill Interchange which serves as a connection between this major freeway and an important county expressway to the north; it will in the future provide a southerly connection to Oakland via the Shepherd Canyon Freeway. The remaining portions of freeway required to provide a continuous freeway from west of Orinda to north of Monument near Concord are under construction and has been discussed under Sign Route 21.

Watkin and Sibbald are the contractors on a \$28,700 landscaping project between Sunnybrook Drive and Hodges Road which should be completed shortly. \$125,000 has been provided in the 1960-61 budget for landscaping the project between Orinda Road and Sunnybrook Drive. Additional funds are provided in the same budget for landscaping the remaining portion near Walnut Creek.

Concord to the Sacramento County Line

Between the westerly portion north of Concord and Neroly Road east of Antioch, Sign Routes 24 and 4 are identical. A major portion of the route between Willow Pass Road and A Street was completed to freeway standards in 1952. South of Sign Route 4 to Concord and north of A Street in Antioch to the bridge, the route has been adopted and design studies are in an advanced stage.

Junipero Serra Freeway

From San Bruno Avenue north to its present intersection with Sign Route 1 in Daly City, the existing Junipero Serra expressway is known as State Highway Route 237. Constructed by Joint Highway District 10, it was taken into the state highway system when that district was dissolved in July of 1956. In this area, numerous studies have been made in connection with the development of other freeways in the vicinity for pos-



Looking north along Sign Route 17 Freeway at Stevens Creek Road Interchange in San Jose. Boscom Avenue Interchange at upper right.

sible relocation between San Bruno Avenue and the San Francisco county line. Public meetings were held in January 1960.

South of San Bruno Avenue this important interstate route was designated by the 1957 Legislature as State Highway Route 239. The route has now been entirely adopted between US 101 south of Ford Road in Santa Clara County to San Bruno Avenue in San Mateo County. Survey control and aerial mapping has been completed. Design studies are under way on over 50 miles of this facility. Including rights-of-way, the cost of the initial development is estimated to be approximately \$74,000,000. Freeway agreements have been executed with most of the local governmental bodies and detailed designs are being made preparatory to right-of-way acquisition.

Sign Route 1

South of San Francisco, this facility is known as the Cabrillo Highway. The route has been adopted for a freeway bypass at Watsonville and preliminary project studies are well advanced for conversion to full freeway from Watsonville to Rob Roy Junction. North of Rob Roy Junction to Santa Cruz, an expressway has been in operation for several years and design studies are well advanced for development of this 6.5-mile section of full freeway.

In the vicinity of Santa Cruz, two projects have been completed to freeway standards. The most recent of these was the 2.1-mile freeway between the junction of Sign Route 17 and 0.3 mile east of Morrissey Avenue. This work was completed in November of 1958. Also completed about this time was the initial two lanes of a future four-lane expressway on new alignment between Swift Street in Santa Cruz and Wilder Creek. This project was jointly financed with Joint Highway District No. 9.

From Wilder Creek to 4.0 miles south of Davenport, a 3.1-mile section of expressway is under construction. Initially two lanes are being constructed with four lanes being built at locations where the terrain restricts sight distance. This work, expected to cost \$940,000, is being jointly financed with Joint Highway District No. 9

which contributed \$240,000. Also under construction is 2.1 miles between New Years Creek near the Santa Cruz county line and 0.2 mile south of Whitehouse Creek. This work involves reconstruction, realignment, and widening and completes the first-stage improvement financed jointly by the State and JHD No. 9. Since the district's organization in 1927, it has contributed approximately \$3,883,000 to the improvement of the 68 miles of Sign Route 1 between Santa Cruz and San Francisco including the \$240,000 being contributed to this \$417,000 project. Funds in the amount of \$150,000 have been provided in the 1960-61 budget for the base and surfacing of a portion of Sign Route 1 between San Gregorio Creek and one mile north of Tunitas Creek in San Mateo County.

Route studies are under way between Canada Verde Creek south of Half Moon Bay and Pedro Valley. Preliminary conferences have been held and geologic and materials studies are about complete for the portion covering the proposed relocation in the Devils Slide area. Public meetings are anticipated in the near future.

Between Pedro Creek and 0.4 mile north of Manor Drive, freeway design studies are under way. The portion north of Manor Drive was completed in 1958 as a four-lane expressway between Manor Drive and Skyline Boulevard in Daly City. Design studies are progressing for its development to a six-lane freeway with additional separation structures.

From Skyline Boulevard near Edgemar Road in Daly City, Sign Route 1 has been developed as an expressway to 19th Avenue in San Francisco. This portion has been in service since 1956.

North of San Francisco, planning studies for relocation of Sign Route 1 between one mile north of Golden Gate Bridge and Point Reyes Station are almost completed. Public meetings will be held soon on the route determination. Funds in the amount of \$120,000 have been provided in the 1960-61 budget for drainage and paving projects at various locations on the Marin coast. \$230,000 has been provided for work on portions between 0.4 mile south of the Marin county line and Bodega Bay.

Route 105—San Mateo and Alameda Counties

Design is under way and rights-of-way are being acquired for a freeway between El Camino Real and the Hayward-San Mateo Bridge and westerly to Junipero Serra Freeway.

The freeway route for the portion in San Mateo County (19th Avenue Freeway) from Sign Route 5 (Skyline Boulevard) to the Alameda county line, a distance of 7.2 miles, was adopted in 1957 by the State Highway Commission. That portion of the route in Alameda County between the county line and Nimitz Freeway was adopted in 1952, and preliminary design has been started.

Preliminary studies have been completed for the widening of the San Mateo Bridge to four lanes and for converting its approaches to freeway standards. These were made by the Division of San Francisco Bay Toll Crossings.

East of the Nimitz Freeway, design studies are well advanced for the interim improvement of this route as a four-lane divided conventional highway along Jackson Street in the City of Hayward.

Stevens Creek Freeway

Design studies are underway and rights-of-way are being acquired for an eight-mile section of this important cross-country facility from Sign Route 17 in Los Gatos to the Bayshore Freeway near Mountain View. From Azule south of Junipero Serra Freeway, the route will be developed as an initial six-lane freeway. The portion from Junipero Serra Freeway to Bayshore Freeway (US 101 Bypass) will be developed as an initial four-lane freeway. Design studies have also been started on the portion of this route between Sign Route 17 and Azule.

Funds have also been provided in the 1960-61 budget for an interim improvement within Sunnyvale pending completion of the future freeway. This project, estimated to cost approximately \$220,000, will provide a four-lane divided arterial along Mathilda Avenue between the Southern Pacific Railroad east of El Camino Real in Sunnyvale to Bayshore Freeway. Rights-of-way are being acquired by the City of Sunnyvale.

San Jose Freeways

Major Interchange,
Other Jobs Described

By HAIG AYANIAN, Assistant District Engineer—Construction



DISTRICT
IV

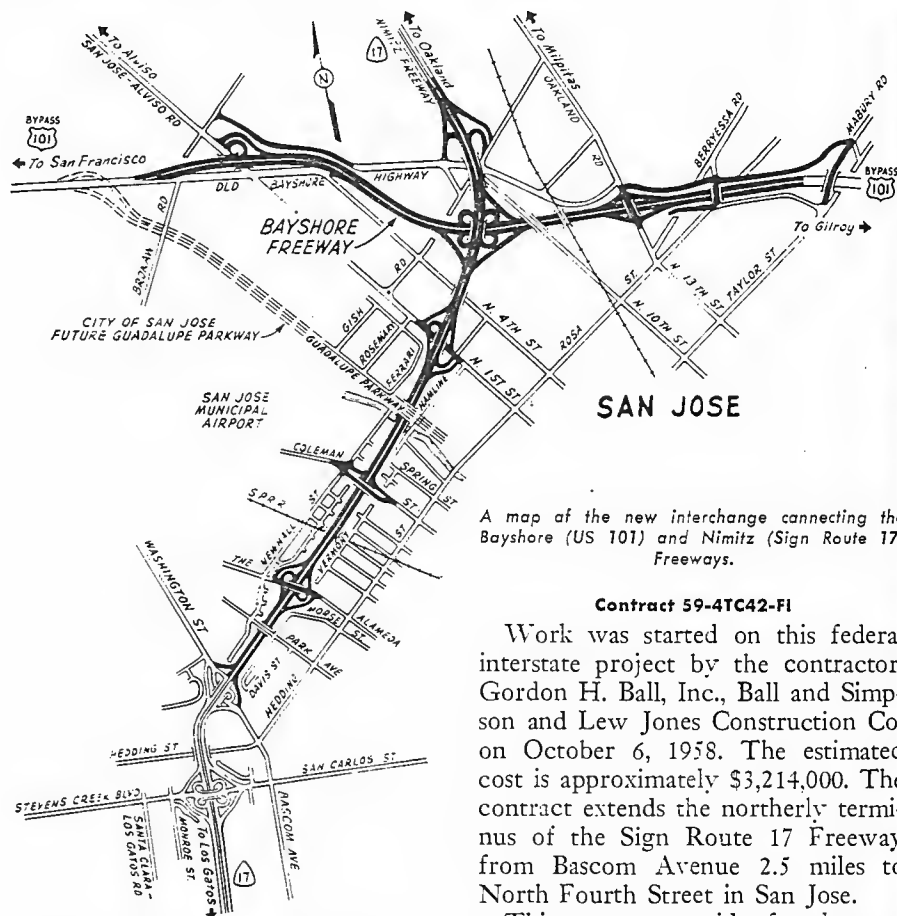
THE SAN JOSE area of Santa Clara County is demonstrating an explosive growth. Subdivisions are replacing the orchards of prunes and apricots at a bewildering rate. The

traffic generated by such growth has created enormous headaches for local governments in this area much as it has in many other areas of California. This condition has been aggravated by the addition of through traffic heading for the hinterlands or the beach.

The days of sluggish and tortured traffic along the old San Jose-Los Gatos Road are gone, much to the gratification of Bay area motorists. No longer must they endure a two-lane highway, cluttered by numerous fruit stands, crossed by a myriad of country and residential streets, and jammed by a seemingly unending stream of vehicles. Bay area motorists bound for the popular summer resort of Santa Cruz can now travel unimpeded through the San Jose area.

The last link in the 75-mile Sign Route 17 Freeway between Oakland and Los Gatos was provided on June 21, 1960, by the opening of Contract IV-59-4TC42-FI from Bascom Avenue to North Fourth Street in San Jose together with the simultaneous opening of a portion of Contract IV-60-4TC2-FI from North Fourth Street to a connection with the Nimitz Freeway at Bayshore Highway (US 101 Bypass). These and previously completed projects, totaling approximately \$15,000,000 excluding rights-of-way, provide freeway connections through San Jose to south of Los Gatos.

In addition to the newly opened leg of SSR 17, the September completion of the remainder of Contract IV-



A map of the new interchange connecting the Bayshore (US 101) and Nimitz (Sign Route 17) Freeways.

Contract 59-4TC42-FI

Work was started on this federal interstate project by the contractor, Gordon H. Ball, Inc., Ball and Simpson and Lew Jones Construction Co. on October 6, 1958. The estimated cost is approximately \$3,214,000. The contract extends the northerly terminus of the Sign Route 17 Freeway from Bascom Avenue 2.5 miles to North Fourth Street in San Jose.

This contract provides four lanes of a future six-lane divided freeway paved with portland cement concrete and includes seven major structures, with frontage roads and ramps. These structures are: the Park Avenue overcrossing, a reinforced concrete box girder with a length of about 159 feet; the Guadalupe Parkway overcrossing, consisting of two parallel bridges, each about 182 feet long and constructed of welded steel girder spans; the Guadalupe River bridge, consisting of two parallel bridges approximately 205 feet long, also constructed of welded steel girders and a concrete deck; the US 101 (El Camino Real) separation, a reinforced concrete box-girder bridge about 200 feet long; the Laurel Street overhead, a pair of parallel, precast, prestressed and reinforced con-

60-4TC2-FI will provide a section of Bayshore Freeway on new alignment through San Jose with a cloverleaf interchange at the intersection of the Nimitz and Bayshore Freeways.

Between this project and the \$3,465,000 Contract IV-60-4TC1-FP, completed in May from the San Mateo county line to Stierlin Road in Mountain View, two contracts have recently been awarded which will complete Bayshore Freeway from San Francisco to San Jose. These two projects, Contract IV-60-4TC71-F and Contract 61-4TC10-FP, will cost approximately \$10,000,000 and will cover a total length of 11.9 miles between Stierlin Road and Brokaw Road.

A more detailed review of these recent and current projects follows:

crete girder bridges each consisting of three spans totaling about 208 feet; the Coleman Street overcrossing, a single reinforced concrete girder bridge approximately 288 feet long; and the North First Street undercrossing consisting of two parallel welded steel girder bridges each about 172 feet long.

All these structures are founded on concrete piles. At two of them, pumping plants were constructed to provide drainage for the depressed sections.

The general route of this project traverses a cross section of the City of San Jose. Portions of it pass through residential, agricultural and industrial areas. Part of the freeway which is depressed below the surrounding area, exposed an underlying stratum of a highly plastic clay. It was necessary to overexcavate this clay in order to provide a suitable base for the roadbed. Construction problems were further aggravated by the fact that this region has been sinking over a period of years, presumably due to the lowering of the water table by intensified pumping for irrigation purposes.

The contractor was represented on the job by Superintendent Hadley E. Bacon and the State by Resident Engineer W. S. Smith and Bridge Department Representative P. N. Olson.

Contract 60-4TC2-F

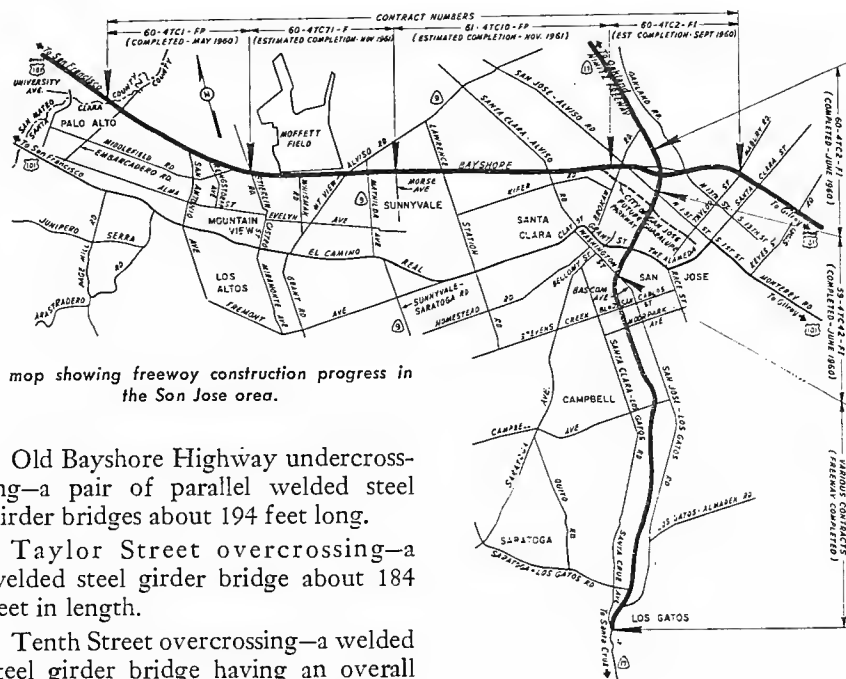
The same contractor was the successful low bidder and started work on February 9, 1959. The cost of this 4.1-mile project will be approximately \$4,350,000. The contract provides in general for a four-lane, ultimate six-lane, freeway with nine major structures. The freeway consists of concrete pavement with necessary ramps and frontage roads.

The major structures are as follows:

North First Street undercrossing—a pair of similar parallel welded steel girder bridges with an overall length of about 214 feet.

North Fourth Street undercrossing—a pair of welded steel girder bridges, each with an over-all length of about 135 feet.

Sign Route 17/Bayshore Freeway separation—a pair of similar parallel welded steel girder bridges each having an overall length of about 197 feet.



A map showing freeway construction progress in the San Jose area.

Old Bayshore Highway undercrossing—a pair of parallel welded steel girder bridges about 194 feet long.

Taylor Street overcrossing—a welded steel girder bridge about 184 feet in length.

Tenth Street overcrossing—a welded steel girder bridge having an overall length of about 244 feet. In conjunction with this structure a pumping plant was constructed to provide for the drainage of the depressed section of freeway in this area.

North San Jose underpass—a riveted structural steel girder bridge of two spans, each having a length of about 59 feet, carrying the Southern Pacific railroad lines over the freeway.

Oakland Road/Bayshore Freeway separation—a welded steel girder bridge with an overall length of about 188 feet.

Berryessa Road overcrossing—a welded steel girder-type bridge having an overall length of about 185 feet.

In conjunction with the construction of the depressed section of the Bayshore Freeway on this contract, it was necessary to make extensive use of temporary detours in order to handle the existing traffic with as little inconvenience as possible.

The plastic stratum mentioned previously was encountered to an even greater degree in this area, and an extra foot of subbase material was placed.

The Berryessa spur of the Southern Pacific railroad was completely relocated as a part of this project to eliminate several grade crossings. The State's contractor graded the roadbed

and the tracks were laid by Southern Pacific forces.

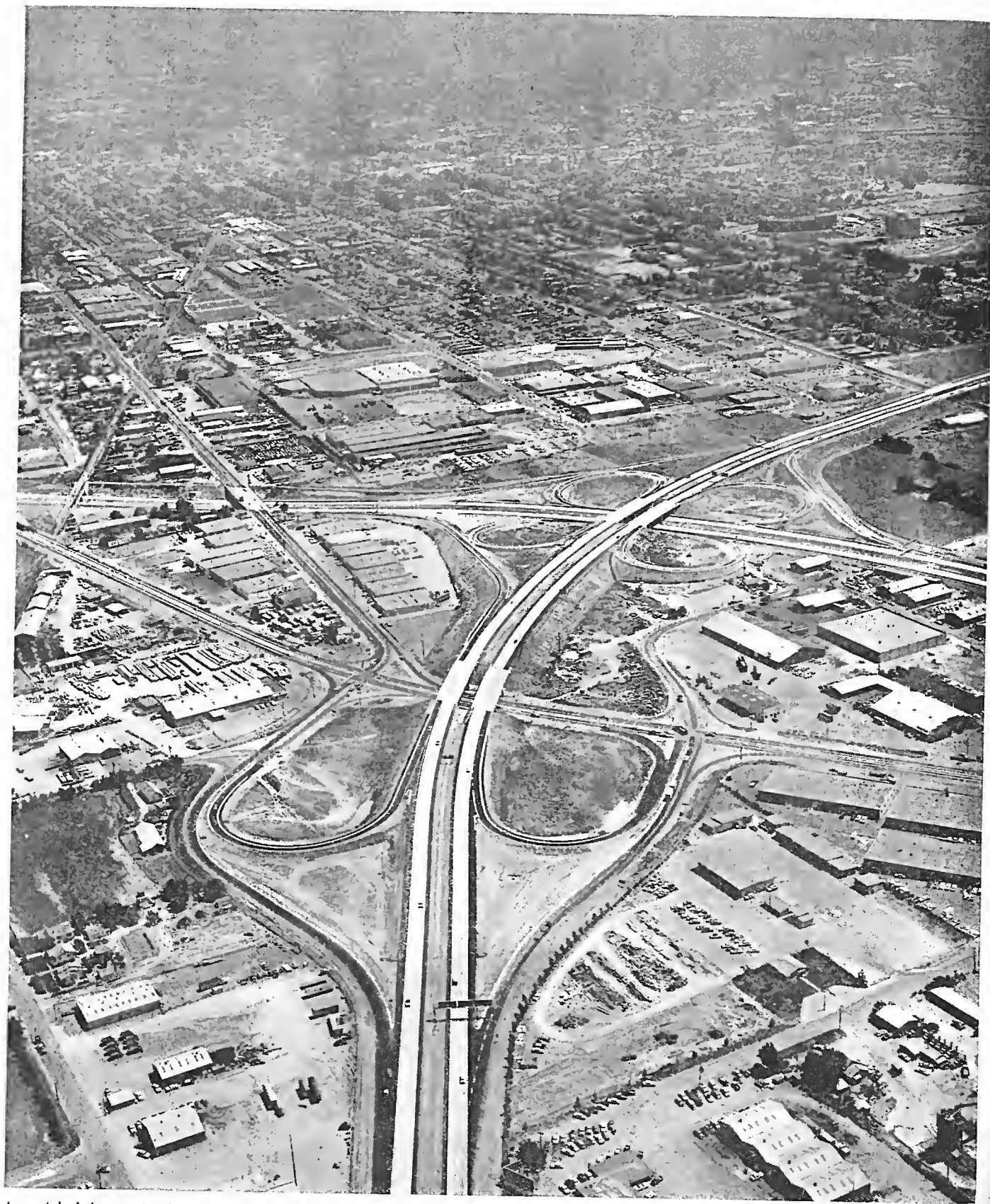
The concrete pavement work on both of these contracts was performed by the same crew as one project. This was done by means of a slipform paver, the first use of this equipment in District IV. Details of this slipform paver have been discussed previously in other issues of this magazine.

Hadley E. Bacon also represented the contractor on this project. L. A. Anderson was the State's resident engineer for the greater portion of the contract and the Bridge Department representative was M. H. Jacobs.

Contract 60-4TC71-F

Recently awarded Contract 60-4TC71-F will carry the Bayshore Freeway from Stierlin Road to Morse Avenue, a length of 5.9 miles. The work includes the construction of three new lanes of concrete pavement paralleling the existing highway and carrying the traffic eastward toward San Jose. The existing lanes will be resurfaced to carry traffic to San Francisco on three lanes and an additional future lane each way will be provided for. There are six major structures, including the Sign Route 9 separation.

This project is along the Moffett Field Naval Air Station and will entail



An aerial of the new Bayshore-Nimitz Freeways interchange in San Jose. The view is southward along the Nimitz Freeway (Sign Route 17). The old Bayshore Freeway (US 101 Bypass) crosses the photo nearest the camera. Beyond is the new Bayshore Freeway completed as part of the interchange construction.



Looking westward on US 101 (Boyshore Freeway) toward the new interchange with the Nimitz Freeway (left background).



Looking north on Sign Route 17 (Nimitz Freeway) with the Bascom Avenue-Washington Street Interchange in the foreground.



A westward view of the Sign Route 17 Interchange in Los Gatos. Sign Route 17 extends horizontally across the middle of the photo passing under the separation structure of the center.

the relocation of many of the Navy's facilities. A major item is the relocation of the Southern Pacific and U.S. Navy rail facilities which serve the air station. Approximately 4,500 feet of track will be required for relocating a portion of the spur. The Navy has given the State permission to use considerable quantities of used 95-pound rail which it has in stockpile. It will thus be possible to perform track work with a minimum of interruption of rail service to the Navy station.

It is estimated that the work will cost approximately \$4,150,000 and will be completed late in the fall of 1961.

The contractor, L. C. Smith & Concar Ranch & Enterprises, is represented on the project by Anthony Bruno. The resident engineer for the State is E. W. Strandberg, assisted by R. L. Vance as Bridge Department representative.

Contract 61-4TC10-FF

This contract, also recently awarded, entails the construction of the final link of the Bayshore Freeway between San Francisco and San Jose and extends from Morse Avenue to Brokaw Road, a length of 6.1 miles. This contract calls for the construction of a six-lane, future eight-lane freeway from Morse Avenue to the Guadalupe Parkway now under construction by the City of San Jose and planned for concurrent completion with Bayshore Freeway. Again, the existing pavement will serve as one roadway and three lanes of concrete pavement will be constructed for the other. The portion from the parkway to Brokaw Road will be four lanes with provision for six in the future. Ten major structures will be constructed to provide a full freeway. The 125 contract items are estimated to cost \$5,779,000 and the estimated completion is about November 1961.

W. G. Remington is the resident engineer assigned to the contract, and M. H. Jacobs is the Bridge Department representative. The contractor is the Allen M. Campbell Company of Santa Ana.

A co-operative agreement with the Santa Clara County Water Conservation and Flood Control District provides that the State, as a part of these two projects, will realign and widen

the existing Guadalupe River channel. The State will obtain all channel material in excess of that required to fill in the old channel and reconstruct dikes. This provides a considerable source of the necessary borrow required for the roadway embankments.

The special provisions for both of the last two contracts allow the use of slip-form paving. It is anticipated that this method will be used and will involve the placing of different slab thicknesses. The two outer lanes of each roadway are designed to be 9" in thickness and the other is 8". The method of slip-form paving chosen by the contractor will be of considerable interest.

The completed contracts on S.S.R. 17 have been or are currently being landscaped. Oleanders in the median will provide an aesthetic and effective screen against headlight glare. The areas outside the shoulders and interchange areas will be further beautified with redwoods and other trees, shrubs and ground cover.

Planting Pleases City

CITY OF MENLO PARK

Menlo Park, California

San Mateo County

July 15, 1960

Mr. J. P. Sinclair

Asst. State Highway Engineer
P.O. Box 3366, Rincon Annex
San Francisco 19, California

Dear Mr. Sinclair:

The City Council has asked me to express its appreciation of the attractive landscaping of the Bayshore Freeway-Willow Road Interchange area. We had been advised that the project would be an excellent one, and it has certainly turned out as predicted.

The city is interested in planting the areas on both sides of the frontage roads and will soon submit plans for your landscape division's approval.

Very truly yours,

JOHN R. JOHNSON
City Manager

Freeway Planner B. W. Booker Dies

B. W. (Barney) Booker, who as Assistant State Highway Engineer in District IV was in a large measure responsible for the concept and construction of the highway and freeway system in the San Francisco Bay area, died July 18. He had retired in May 1959. He was 68 years old.

To the time of his retirement Booker had served 28 years with the Division of Highways, the last seven of which were as Assistant State Highway Engineer in charge of District IV. During those seven years of his administration highway improvements costing many millions of dollars were effected.

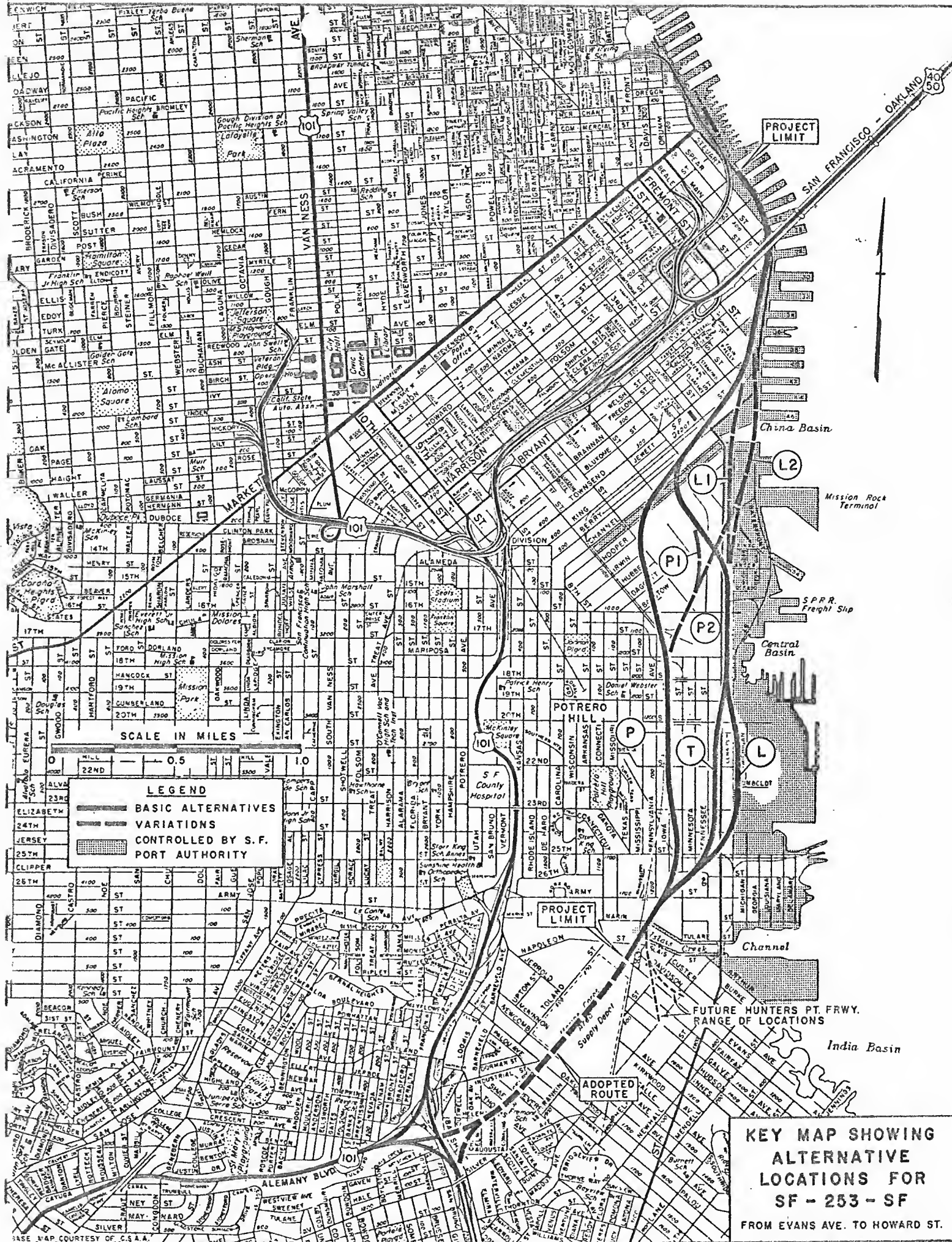
These included completion of the James Lick Memorial and Bayshore Freeways from the San Francisco-Oakland Bay Bridge to Palo Alto; completion of the Nimitz Freeway between San Jose and Oakland; virtual completion of US 40 as a freeway connecting to the new parallel Carquinez Bridge, and construction on many other routes.

In all, Booker spent more than 16 years in District IV, having been appointed assistant district engineer in 1942 and promoted to district engineer in charge of operations in 1947. Five years later he became Assistant State Highway Engineer upon the retirement of the late J. H. Skeggs.

He was born in Topeka, Kansas, and came to California in 1899. He was educated in the San Francisco public schools, Polytechnic High School and the University of California.

Booker leaves his wife, Leota; a daughter, Mrs. Barbara Riffel of Stockton, Kansas; two grandchildren, and two sisters, Miss Niara Booker of Oakland and Mrs. Clara Stone of New York. A son, Lt. Robert Booker, was killed in action in World War II.

Booker made his home in Oakland.



TRAFFICWAYS IN
SAN FRANCISCO-A
REAPPRAISAL

NOVEMBER
1960

of the Trafficways Reappraisal Survey

RECOMMENDATIONS

It is recommended that a fifteen-year program of development be adopted to add 9.1 miles of freeways to the system of freeways now existing, under construction and authorized in San Francisco. These additions are estimated to cost \$216,000,000 at 1960 prices. Assessed value of properties needed to be acquired constitute less than one-half of one per cent of the total assessed value of land and structures in San Francisco.

These recommended projects include:

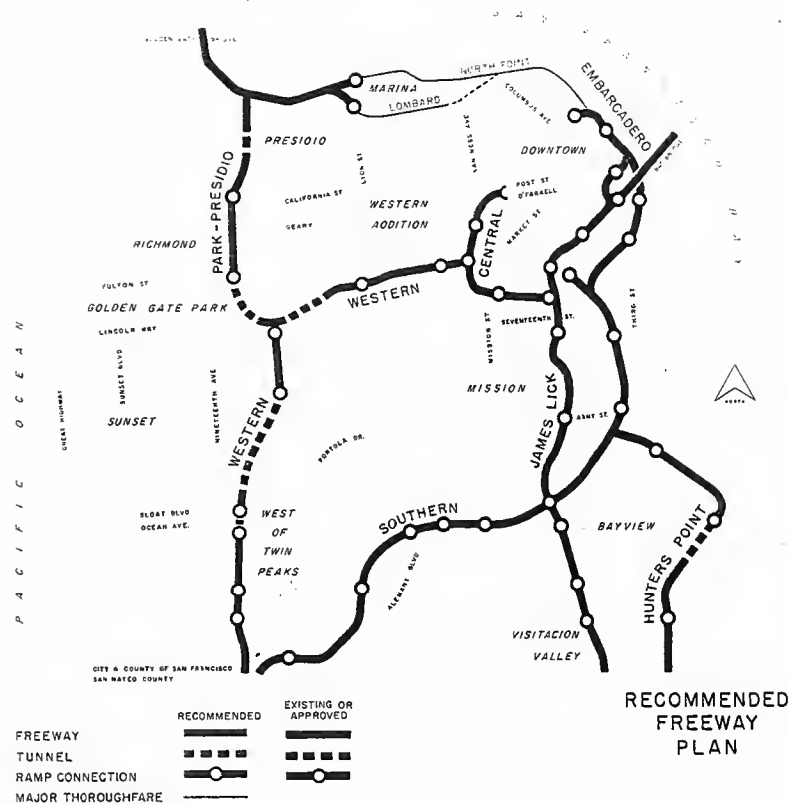
A Modified Western Freeway: Modified from the 1951 Trafficways Plan alignment to provide for extensive tunneling and other design changes to require fewer residential properties; estimated to cost \$173,000,000 for 7.1 miles of route.

The Park-Presidio Freeway: Conversion of Park-Presidio Boulevard into a freeway; 0.9 miles long, estimated to cost \$2,000,000.

Extension of the Central Freeway: A minimum extension of the existing Central Freeway to ramps at O'Farrell and Post Streets carrying freeway traffic across Van Ness Avenue to provide convenient access to downtown; estimated to cost \$9,000,000 for 0.5 miles of route.

The Russian Hill Tunnel: A tunnel (0.6 miles) from North Point Street and Columbus Avenue to Lombard and Franklin Streets to cost \$32,000,000, to relieve traffic congestion through the North Beach and Marina districts, with expressway-type improvements on Lombard and North Point Streets. If in later years a freeway were found necessary, it could be integrated with the tunnel.

It is further recommended that, except for the Park-Presidio Freeway route and the Russian Hill Tunnel, consideration of freeway projects to serve the Marina, North Beach, and the Golden Gate Bridge be postponed until decisions have been made on other interrelated factors such as rapid transit to Marin County and an additional Bay crossing to Marin County.



DEVELOPMENT OF THE TRAFFICWAYS PLAN

The Trafficways Plan, adopted by the City Planning Commission in 1951, is the outgrowth of two previously developed plans for high-capacity traffic arteries which were drawn up in the 1940's: *The Major Thoroughfares Plan* of the Transportation and Utilities Section of the Master Plan adopted on December 20, 1945, and *Report to the City Planning Commission on a Transportation Plan for San Francisco* published in 1948 after an extensive and comprehensive survey of traffic and transit problems by the Transportation Technical Committee assisted by planning and engineering consultants.

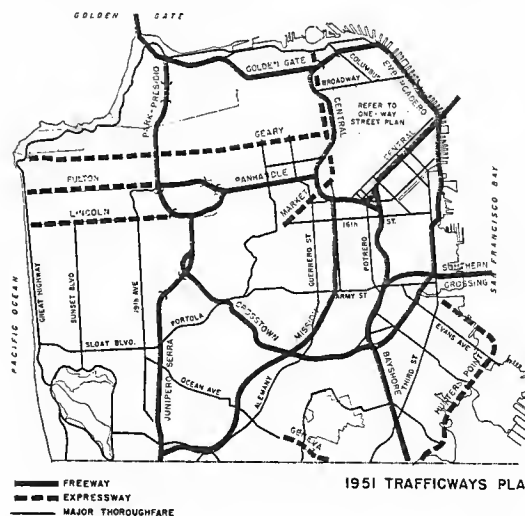
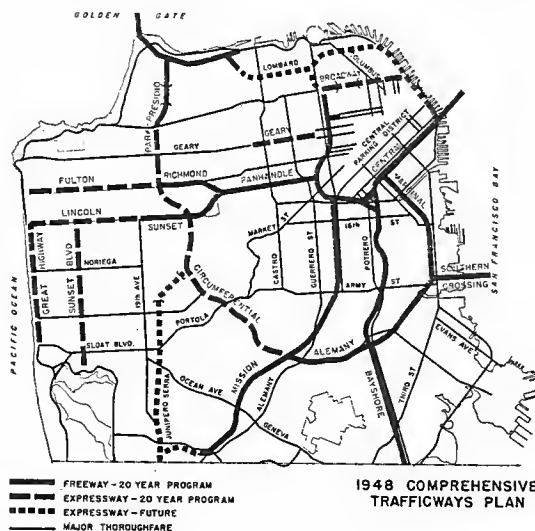
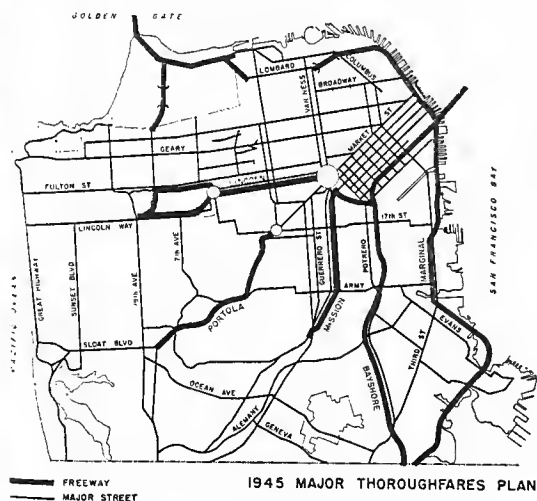
The 1945 Master Plan was the first long-range, comprehensive plan adopted by the City Planning Commission and included plans for freeways, parkways, rapid transit lines

and off-street parking. This plan was, in effect, an interim plan, and one of the basic recommendations contained in the adopted report on the plan was for a more comprehensive survey to be made of the entire transportation problem of the city, including freeways, rapid transit, off-street parking, and coordination of traffic signals. The city was beset with problems of street congestion, downtown parking deficiencies, obsolescence of its surface transit facilities and inadequacy of its traffic control system.

Consequently, at the initiation of the City Planning Commission, the Board of Supervisors in 1947 appropriated \$200,000 for a comprehensive transportation survey. A Transportation Technical Committee representing the Department of City Planning, Department of Public Works, Public Utilities Commission, and Police Department was ap-

pointed by the Mayor to manage the project. Two consulting firms, DeLeuw, Cather & Company, consulting engineers, and Ladislav Segoe & Associates, consulting city and regional planners, were engaged to assist in the work. Completed in November of 1948, the report resulting from this study recommended a coordinated system of freeways, expressways, parkways, major and secondary thoroughfares; rail line subways, bus subways; a completely modernized program of traffic control, a large-scale program of downtown off-street parking facilities; and a revised city-wide land use plan utilized as a framework for the transportation program.

After approximately two years of study, the City Planning Commission held final public hearings on the proposed Trafficways Plan, an outgrowth of the proposals contained in the 1948 report, and it was formally adopted in March 1951.



DEVELOPMENT OF THE FREEWAY ROUTES

The 1951 Trafficways Plan contained more mileage of freeways than either the 1945 Major Thoroughfares Plan or the 1948 Transportation Plan report. The 1945 plan was not a complete plan; only the most urgently needed freeway projects were included pending the comprehensive survey. In the 1948 report, a distinction was made between routes on which heavy traffic was predicted within the next decade, which were recommended for freeways, and routes on which heavy traffic was not predicted for ten to twenty years from 1948, which were recommended as expressways.

A Marginal Freeway was an important element of the 1945 plan, to provide a high-capacity artery serving the city's eastern industrial and waterfront districts, as well as the financial district. Starting from Lombard Street and Van Ness Avenue, it tunneled under Russian Hill and followed the present line of the Embarcadero and Hunters Point Freeways to the county line. In the 1948 Transportation Plan report, the Embarcadero Freeway north of the Ferry Building was shown as an expressway, and the part between the Ferry Building and Army Street was considered to be a part of the approach system to the Army Street Southern Crossing. South of Army Street, a new street was shown in the recommended 1948 plan instead of the Hunters Point Expressway later included in the 1951 Trafficways Plan. The Trafficways Plan also restored the original concept of the Marginal Freeway north along The Embarcadero, and along Bay or North Point Street to the Russian Hill tunnel to Van Ness Avenue.

The Bayshore Freeway is shown relatively unchanged in all three plans. Its precise route had already been agreed upon by the City and the State by the time the 1945 Major Thoroughfares Plan was adopted, and was incorporated in it and subsequent plans.

The Mission Freeway has appeared in all three plans, and in the 1945 and 1948 plans was conceived as a joint highway and rapid transit route. In 1945 it extended only to Monterey Boulevard, but in 1948 it was extended southwesterly along the right-of-way of the old Valencia Branch of the Southern Pacific Railway to the county line near Junipero

Serra Boulevard. This concept was incorporated in the 1951 Trafficways Plan, although the section southwest of San Jose Avenue and Monterey Boulevard was renamed as part of the Southern Freeway. Because the Mission Freeway north of Monterey Boulevard was not included by the Legislature as part of the State highway or freeway system, however, it had not been considered as an active project for several years prior to the freeway resolution.

The Portola Freeway, included in the 1945 Major Thoroughfares Plan, was subsequently converted into a four-lane major thoroughfare which has been built as the Market-Portola improvement with City funds.

The Lincoln Freeway in the 1945 plan was a short radial route from the Civic Center to Golden Gate Park located between Fell and Oak Streets with two branches: one south to Lincoln Way and Nineteenth Avenue, and another north to Fulton Street and Park-Presidio Boulevard. This concept was incorporated in the 1948 plan as the Panhandle Freeway with Richmond and Sunset branches on either side of Golden Gate Park, and with the exception of the Richmond branch, became a part of the Western Freeway in the 1951 Trafficways Plan.

Freeways in the Western Part of the City. In the 1945 Major Thoroughfares Plan, it will be noted that no freeways were planned for the areas west of Park-Presidio Boulevard and Nineteenth Avenue, and except for the Bayshore and Marginal Freeways, none were planned south of the intersection of San Jose Avenue and Monterey Boulevard. This general pattern was also followed in the 1948 plan where elements later included in the Trafficways Plan were designated as expressways.

In the development of the adopted Trafficways Plan, the decision was made to show as freeways all routes that might become freeways by conversion from expressways.

The availability of additional State Highway Users Funds for State highway system construction authorized in the Collier-Burns Act of 1948 brought the time within the foreseeable future when State highway system routes in the Trafficways Plan might be built.

Thus, the Circumferential Expressway became the Crosstown Freeway, the Junipero Serra Expressway became a part of the Western Freeway and additions such as the Golden Gate Freeway and the Park-Presidio Freeway were made to the system to provide for:

1. Continuous freeway connections between the city's gateways, such as the Golden Gate Bridge, the San Francisco-Oakland Bay Bridge, the proposed Southern Crossing, and Peninsula entrance freeways.

2. A system of radial routes connecting these gateways as well as the city's residential areas with downtown and industrial employment areas.

3. A system of ring roads or circumferential routes to provide crosstown connections to by-pass the downtown and industrial areas and to provide easiest passage through the city of "gateway-to-gateway" external traffic.

PRINCIPLES, OBJECTIVES AND STANDARDS

In addition to providing the pattern of radial, circumferential and inter-gateway routes for the free flow of large volumes of traffic, the Trafficways Plan also contains the following basic planning concepts:

1. The routing of main traffic arteries so that they do not cut through natural community entities, but pass around them, preferably following natural separators where available, such as topographical features.

2. The designing of routes to carry public transit vehicles where possible.

3. The physical separation of opposing lanes of traffic; use of grade separations and use of local service drives to give maximum expressway character to major thoroughfares that are not full freeways.

4. Landscaping and parkway treatment to be applied wherever possible; view points to be provided, and with special parking areas, where appropriate.

5. Freeways to have not more than three traffic lanes in each direction; access ramps to be located at half-mile to one-mile intervals, with proper accelerating and decelerating lanes; widest possible rights-of-way and maximum landscap-

ing to be employed to protect and enhance adjoining properties.

6. Continuous elevated structures to be avoided, except in industrial districts where middle-of-the-block locations were to be followed, or except if the route was part of a bridge approach, or if required by topographical conditions, such as a deep valley between hills. Preferably, freeways were to be on grade, or semi-depressed, or on a semi-elevated fill.

FIRST FREEWAYS CONSTRUCTED

San Francisco's first freeway put into service was the part of the Bayshore (later renamed the James Lick Memorial) Freeway completed between Alameda Boulevard and 24th Street in August of 1951. In rapid succession other parts of the James Lick Memorial Freeway were completed, extending its service to Ninth Street, and then to Fourth Street and the Bay Bridge, and via the Central Freeway, to Mission Street and in 1958 to Golden Gate Avenue and Franklin Street.

It is now possible to drive without encountering a traffic light from Peninsula points to Fell and Laguna Streets, Golden Gate Avenue and Franklin Street, Fourth and Bryant Streets, and Broadway and Battery Street via completed sections of the James Lick, Central and Embarcadero Freeways, each of which has been built along routes indicated in the Trafficways Plan.

SAN FRANCISCO



It was found convenient, in the areas north of Potrero Hill, where parts of the close-in, high-value South of Market industrial district were traversed, to use continuous elevated trestle-type structures. These allow for all cross streets and rail lines to continue uninterrupted on the surface and for economic use of the land spaces under the freeway as parking lots, bus storage yards, truck marshalling yards, and contractors' equipment yards. If other design patterns had been followed, this use would not be possible. Only on 13th Street was an existing street roofed over by the elevated. Elsewhere, mid-block locations between existing streets were followed.

This use of elevated structures, although appropriate for the particular areas traversed, became synonymous with the word "freeway" in the minds of many people, and influenced their attitudes towards freeways proposed through their own community areas.

DESIGN STUDIES STARTED ON OTHER ROUTES

In 1948, by the passage of the Collier-Burns Act, the State gasoline tax was raised to provide additional funds for the elimination of deficiencies in the State highway system. All of the increased receipts were earmarked for construction of needed State highways and freeways, including portions of these systems within San Francisco.

The State Division of Highways soon began preliminary planning studies and surveys for the Western Freeway, Junipero Serra Freeway and Park-Presidio Freeway routes in San Francisco. It became known that, in accordance with the adopted Trafficways Plan, one of the freeways would go through the Golden Gate Park Panhandle and another would cross Golden Gate Park from Seventh Avenue to Park-Presidio Boulevard. Alarm was spread that Golden Gate Park would be irreparably damaged. The possible use of the Panhandle for a freeway right-of-way also created considerable opposition. The Recreation and Park Commission of San Francisco passed a resolution opposing a freeway in the Panhandle and any above-ground crossing of Golden Gate Park. Subsequently the City Planning Commission in 1955 passed an amendment deleting from the Trafficways Plan the por-

tion of the Western Freeway proposed for the Park Panhandle "pending further study."

The possibility of financing the designated Interstate routes in San Francisco with "90 per cent money" from the Federal government stimulated State engineers to initiate preliminary design studies for their planning, whereas previous to passage of the 1956 Federal Highway Act it had been assumed that work on these projects might be many years in the future.

Another stimulant to early design work on these projects was the increased volume of vehicular traffic pouring daily into San Francisco from its neighbor counties, indicating peak hour congestion crises in the not-too-distant future. By 1955 the James Lick Memorial Freeway was carrying approximately twice the volume that had been predicted for 1960 in the 1945 studies. Thus, the engineers felt a sense of urgency that possibly might not have been shared by the San Franciscans who had not yet experienced the unanticipated congestion.

Changed engineering standards were also reflected in this preliminary planning. Where freeways with not more than three traffic lanes in each direction had been considered the desirable maximum in the 1951 Trafficways Plan, the Federal Interstate Highway System standards required sufficient space for four traffic lanes in each direction as well as space for emergency turn-out lanes on either side of each one-way four-lane roadway. Grades had to be less than previously required, design speeds higher, and curves more gradual. In general, the freeways began to take on more the character of engineering structures designed for fast movement of heavy vehicles than the "express parkways" of the late 1930's and 1940's, such as the Arroyo Seco parkway in Los Angeles and the Westchester County and Long Island parkways in New York.

PUBLIC CONCERN WITH FREEWAY DEVELOPMENT

When public hearings were held by the City Planning Commission in 1951 on the adoption of the Trafficways Plan, little public concern over the location of any particular project was expressed, as the plan was considered to be generalized and far in the future. It was only when detailed engineering plans were drawn that the public became aware of the effect of a project upon their property, their neighborhood, and the appearance of the city.

THE EMBARCADERO FREEWAY

As far back as 1935 the concept of an elevated express highway along The Embarcadero had been discussed. A similar proposal was included in the Daniel Burnham Plan for San Francisco published in 1905. The Marginal Freeway along The Embarcadero was a keystone in the proposed traffic arteries incorporated in the 1945 Master Plan. The elevated West Side Highway along New York City's Hudson River waterfront provided a successful example.

The 1945 Master Plan proposed an underpass at the Ferry Building to allow for a plaza at the proposed Ferry Building "Water Gate." Elsewhere along The Embarcadero the elevated structure was proposed to go through an industrial and warehouse district where it was not deemed to be detrimental. This concept was carried forward in the 1948 Transportation Plan report and in the adopted 1951 Trafficways Plan. Not long thereafter, the

1. The State Division of Highways determined that an eight-lane double-deck structure would be necessary between Howard Street and Broadway, on the basis of traffic estimates and right-of-way problems.

2. Steps were taken to redevelop the 18-block area occupied by the wholesale produce market as a new office tower and apartment tower district, to be known as the Golden Gateway, utilizing Federal urban renewal loans and grants.

3. A Ferry Park Plaza was proposed as a State Park in the redevelopment project, but the State Park Commission would not take action because of the anticipated presence of the double-deck freeway.

By the time contract bids were ready proposals were advanced to curve the freeway away from the Ferry Building or to construct an underpass in the area of the proposed Ferry Park. These proposals received thorough consideration by City and State officials and were given prominent coverage by the city's press. However, when the Division of Highways determined that the underpass would cost \$15,000,000 more than the \$9,000,000 elevated structure, a great portion of public support for the below-grade alternate vanished. The Embarcadero Freeway, now in operation, continues to be a source of controversy.

Construction of the Central Freeway as a double-deck structure from Mission Street to Franklin Street was completed in 1958, and gave added weight to a general impression that all future freeways were to be elevated.



THE EMBARCADERO FREEWAY



THE CENTRAL FREEWAY

THE WESTERN FREEWAY

After the designation of the Western Freeway as a part of the Federal Interstate System of Highways, preliminary planning work for this route was initiated in the District IV office of the State Division of Highways. It appeared that several blocks of improved land north of St. Francis Circle and south of Golden Gate Park would be involved. Alarmed civic leaders formed a group known as the Property Owners' Association to study the problems posed by the freeway.

The Division of Highways was invited to explain its plans at a public meeting sponsored by the civic clubs in the auditorium of Lincoln High School. Hundreds of property owners and interested persons attended. Sufficient factual data on the several possible routes through the area were not available at that time to answer all the questions, and the result was to make many residents of the area fearful that their own property was endangered and that the engineers were secretive about the plans. The concept that a freeway could be built as a below-grade parkway, with frequent overpasses for pedestrians and cross streets, was not effectively demonstrated.

The Property Owners' Association members communicated with civic, neighborhood and merchants' clubs throughout the city on the problems presented by possible freeway projects. There was a spontaneous and immediate response. Merchants in the Polk Street business district between Geary Street and Broadway feared that their district would be destroyed by the proposed Central Freeway. The merchants and property owners in the Marina feared that the Golden Gate Freeway would be a barrier that would cut off one part of their district from the other. The Telegraph Hill Dwellers' Association anticipated with distaste an extension of the double-deck elevated Embarcadero Freeway around their high-value, view-conscious hill. The Glen Park property owners group feared that the Crosstown Freeway would liquidate their neighborhood business center at Bosworth and Diamond Streets and destroy part of their residential area.

THE WESTERN FREEWAY SURVEY

As a result of this expression of neighborhood feeling, a survey was authorized by the Board of Supervisors at a cost of \$40,000 to determine whether a Western Freeway was necessary, and, if so, to recommend the route it should follow. The firm of Wilbur Smith and Associates, traffic and transit consulting engineers, was engaged for this survey in June of 1957. Traffic counts, origin-destination surveys, and personal interview surveys were made of the city's southwestern quadrant, as well as analyses of present and future land use trends, population trends, and trends of development and traffic potential for northern San Mateo County.

On December 17, 1957, the consultants submitted a report on the *San Francisco Western Freeway, Phase I, Determination of Need*, in which they set forth their analysis of findings and their conclusions that a Western Freeway would be necessary within ten years.

In September of 1958 the second part of the consultants' report, *San Francisco Western Freeway, Phase II, Route Location and Economic Study*, was completed, in which alternate routes for a Western Freeway were analyzed and compared.

The consultants concluded that:

"The need for a Western Freeway is indicated despite the development of a convenient rapid transit service to the downtown area of the type recently recommended to San Francisco, and despite other trafficway improvements which are under construction or planned for other major corridors of traffic movement. The planning of this freeway should be coordinated with the Master Plan for trafficways, with plans for the provision of adequate parking and other terminal facilities, with land use plans and developments, and with other civic plans related to the overall transportation needs of the city."

It was found that existing traffic arteries going through the Western Freeway study area—Seventh Avenue-Laguna Honda Boulevard, Nineteenth Avenue, Sunset Boulevard, and Great Highway—taken together were inadequate for current peak hour traffic. This resulted in a redistribution of traffic to less direct routes, and in a lengthening of the peak period. Two of the most direct north-south routes—Nineteenth Avenue and Seventh Avenue-Laguna Honda Boulevard—were found to be completely inadequate, in that current volume of traffic exceeded practical capacity. This was not true, however, of the two indirect routes, Sunset Boulevard and Great Highway.

The origin and destination surveys indicated that about two-thirds of the vehicular trips had one or both ends of the trip in the study area. Only one-third of the vehicular trips were through the study area with most of them from San Mateo County to other areas in San Francisco. Only four per cent of the total trips had both origin and destination outside of the city.

While San Francisco was expected to increase in population by not more than 10 per cent by 1980, San Mateo County was expected to more than double its population. More automobiles per capita were also expected, both in San Francisco and in San Mateo County.

It was predicted that the traffic entering and leaving San Francisco would almost double by 1980, creating intolerable congestion on the James Lick, Southern, Hunters Point and Embarcadero Extension Freeways which would be in service by that time. The existing major thoroughfares serving the Western Freeway study area would also be intolerably congested. It was estimated that

traffic volume demands in 1980, for movements traversing, originating in or ending in the study area, would exceed the practical capacity of the existing routes by about 40 per cent. The consultants concluded that future traffic demands, primarily for trips originating and or ending in San Francisco, made a Western Freeway essential.

ALTERNATE ROUTES STUDIED

The consultants' contract with the City and County required that four specific routes be studied for a possible Western Freeway:

1. The Trafficways Plan alignment, Alternate A
2. A route near Nineteenth Avenue, Alternate B
3. A route along Sunset Boulevard, Alternate C
4. A route along Great Highway, Alternate D

In their analysis they took into consideration construction costs, right-of-way costs, number of properties and number of dwelling units to be acquired, length of route and comparative driving time from Junipero Serra Boulevard at the county line to the vicinity of Kezar Stadium. Relationship to topography, land use and centers of population, shopping and employment were considered, along with locations of churches, schools, and other institutions. Traffic service to be provided by the alternate routes and the amount of traffic that could be expected to be attracted to them in comparison with their anticipated cost were other important factors considered. For instance, a route that would attract little traffic was considered to be inadequate in that it would not fulfill one of the principal objectives of a Western Freeway, the removal of existing or predicted future traffic congestion from the surface streets of southwestern San Francisco.

The Trafficways Plan Route: Alternate A. Junipero Serra Boulevard was to be converted into a six-lane below-grade divided freeway. From St. Francis Circle north to Santiago Street, however, this route involved taking six blocks of single-family residences between Fourteenth and Fifteenth Avenues. A 3,700-foot twin-bore tunnel would take the artery beneath Golden Gate Heights. Parts of eight residential blocks would be taken in the Parnassus Heights area. An easterly branch consisted of a tunnel through Golden Gate Park past Kezar Stadium to the Panhandle, and a northerly branch went diagonally across Golden Gate Park via tunnel to Park Presidio Boulevard.

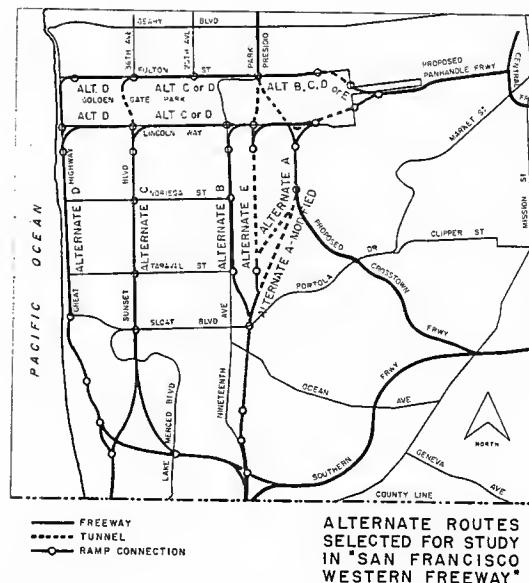
The Modified Trafficways (Long Tunnel) Plan: Alternate A-Modified. A 5,300-foot tunnel, with a portal at Wawona Street one block north of St. Francis Circle, was substituted for the shorter tunnel at Santiago Street to save five blocks of homes from acquisition.

The Nineteenth Avenue Route: Alternate B. This particular alignment, in order to accommodate the necessary freeway widths and underpass space, would affect more properties than any other alternate. It cut through the grounds of the Christian Science Benevolent Association, was across the street from the Shriners Hospital, and conflicted with several churches and schools.

Sunset Boulevard: Alternate C. Much public discussion centered around the concept of putting the freeway on Sunset Boulevard, which could be converted without taking private property. Widening of Lincoln Way to accommodate the freeway would be necessary either at the expense of all of the residential structures fronting on Lincoln Way from 36th Avenue to Seventh Avenue, or at the expense of a strip of Golden Gate Park. This route included bridging Lake Merced, a rearrangement of the Harding Park municipal golf course, and the construction of a freeway along Brotherhood Way bordering a group of church and fraternal properties.

Great Highway: Alternate D. This route has the same problems as Alternate C but to a greater degree.

Alternates C-Modified and D-Modified. Another proposal was to split the freeway along the park into two one-way roadways, one parallel to Lincoln Way eastbound and one parallel to Fulton Street



westbound. This would involve a lesser encroachment on the park on the Lincoln Way side, but would add a new encroachment of equal width on the Fulton Street side.

Junipero Serra Extension, Alternate E. This was a proposal to continue Junipero Serra Freeway north, between Fourteenth and Fifteenth Avenues to Golden Gate Park where a cross-park tunnel would provide a direct connection with Park-Presidio Boulevard. This route involved a mile-long tunnel under Golden Gate Heights and would require the acquisition of three residential blocks near Golden Gate Park and five blocks near St. Francis Circle for right-of-way. It would also necessitate an encroachment on Golden Gate Park along Lincoln Way and Fulton Street for about seven blocks.

THE C AND D ROUTES would attract only a third to a half as much traffic as the inner routes. It might even be questioned whether the volumes predicted for the outer routes would necessitate freeway design, since expressway or major thoroughfare design could probably accommodate these lower predicted volumes. The existing and future congestion and peak hour overloads on existing inner routes, however, would continue and become more aggravated.

The report pointed out that major disadvantages were common to the circumferential routes, C, D, C-Modified and D-Modified:

1. The longer driving distance for most San Francisco residents would mean that many motorists would continue to use existing congested closer-in arteries; thus, the new routes would not be used to planned capacities, nor would they be economically justified.

2. Use of Sunset Boulevard or Great Highway would remove them from their present "pleasure drive" category and prevent the continuation of recreational uses along their rights-of-way, which might prove to be a considerable loss.

3. Considerable intrusion on Golden Gate Park would be involved to provide for the border strips and the cross-park tunnels, and much of the planting that gives the park its character would be uprooted.

The extra cost of the longer tunnel in the A-Modified route is somewhat offset by a lower cost of right-of-way, as the loss of homes is about half that in Alternate A.

The only route that disturbs fewer dwellings is the C-Modified Sunset Boulevard-Lincoln Way-Fulton Street plan. However, approximately 4.8 acres of Golden Gate Park land would be required, which, it is estimated, has a value of almost two and a half million dollars. The C plan involves taking a considerably higher number of single-family dwellings than the A-Modified plan.

With these considerations of minimum disruption to homes, plus maximum traffic service benefits, the consultants recommended the A-Modified plan as the best of those studied.

SUMMARY AND COMPARISON OF ALTERNATE WESTERN FREEWAY PROPOSALS

	Alternate A	Alternate A-Modified	Alternate C	Alternate C-Modified	Alternate E
TOTAL COSTS FOR ROUTE	\$61,217,900	\$66,941,300	\$40,668,300	\$41,348,200	\$68,281,900
Total Construction Costs	43,748,500	52,378,600	20,347,900	24,449,000	52,766,000
Total Right-of-Way Costs	17,469,400	14,562,700	20,320,400	16,899,200	15,515,900
Private Property	15,680,200	12,767,200	13,095,000	8,408,600	13,807,000
Public Property	1,789,200	1,795,500	7,225,400	8,490,600	1,708,900

PRIVATE PROPERTIES TAKEN

Number of Buildings	549	446	451	240	454
Single-Family Homes	325	187	257	104	369
Other Dwelling Units	806	808	668	489	541
Commercial Units	69	56	34	33	52

Wilbur Smith and Associates: *San Francisco Western Freeway, Phase II, Route Location and Economic Study, 1957.* Table 9, Page 93 and Table 10, Page 94.

ESTIMATED 1980 DAILY TRAFFIC VOLUMES

SAN FRANCISCO WESTERN FREEWAY

Freeway Alternate	County Line to Sloat Blvd.	Sloat Blvd. to Lincoln Way
A—Trafficways Plan Route	86,000-96,000	33,000-124,000
B—19th Avenue Route	30,000-90,000	33,000-104,000
C—Sunset Boulevard Route	35,000-43,000	55,000-60,000
D—Great Highway Route	23,000-35,000	39,000
E—Junipero Serra Extension	32,000-92,000	85,000-100,000

Wilbur Smith and Associates: *San Francisco Western Freeway, Phase II, Route Location and Economic Study, 1957.* Table 6, Page 86.

THE FREEWAY REVOLT

While the Western Freeway survey was under way, anti-freeway petitions containing approximately 30,000 signatures were presented at City Hall. Although the main area of activity was the Western Freeway study area, support was evident from other districts. While some city-wide groups such as the Central Council of Civic Clubs and the Council of District Merchants' Associations supported the protesters, others such as the Chamber of Commerce and the Downtown Association voiced attitudes favorable to freeways. In January, 1959, the freeway revolt culminated in the Board of Supervisors resolution quoted on page 8.

THE PACIFIC HEIGHTS TUNNEL

As a solution to the problem of providing a continuous connection through San Francisco for the Federal Interstate Highway System, Supervisor William Blake in the spring of 1959 proposed a long vehicular tunnel under Pacific Heights to connect the end of the Central Freeway at Golden Gate Avenue with the Golden Gate Bridge approach at Richardson Avenue. A study of this project was made by the San Francisco Department of Public Works, including route feasibility and cost estimates.

MAYOR'S COMMITTEE TO STUDY FREEWAYS

home owners' associations, improvement clubs, labor unions, merchants and business groups to constitute the "Mayor's Committee to Study Freeways." Its purpose was to find a constructive answer for the city's need for traffic arteries. The chairman was Chris D. McKeon of the Property Owners' Association and the vice-chairman was Edward Barry of the West Portal Home Owners' Association.

PROGRAM OF THE MAYOR'S COMMITTEE

At its first meeting, held on May 21, 1959, the committee determined that its principal functions were: "1. to determine first of all if additional freeways are needed in San Francisco, and 2. if it was found that they were needed, to recommend a location for them which they would do the least damage to the citizens of San Francisco, conserving their homes and property."

Meeting at least once a month, the committee and its subcommittees had a high level of participation and interest. The facilities of the Department of Public Works and the Department of City Planning were made available to assist it in its deliberations and studies. Traffic engineers of the Department of Public Works ran special traffic counts of specific intersections and held a briefing session on the significance of origin-destination studies and other basic data. Conferences were held with staff engineers of the State Division of Highways, the City Planning Commission and staff members of the Department of City Planning. The Wilbur Smith report with its comparative analyses of Western Freeway routes was used as a basic study text.

The committee divided itself into groups to study three parts of the city: 1. the western corridor, approximately the Western Freeway study area; 2. the southeastern corridor to the east of the western corridor, and east of Market Street, Thirteenth Street and Harrison Street; and 3. the northwestern corridor made up of the rest of the city.

General questions set forth to be studied by the Mayor's Committee and its subcommittees were: feasibility of rapid transit on the Golden Gate Bridge; the future of the San Francisco Presidio; whether a second crossing to Marin County would be needed, and where; feasibility of a Pacific Heights Tunnel; location of a second Bay crossing to Alameda County; and the effect of a San Francisco rapid transit system on traffic patterns and demand.

When the committee submitted its report on April 22, 1960, a divergence of opinion was reflected in the submission of two reports from committee members: a majority report and a minority report.

THE MAJORITY REPORT

Chairman McKeon submitted the majority report, representing the opinion of nine members. Its main conclusions were:

1. The Southern Freeway should be completed in its entirety at an early date, with four lanes in each direction, including its extension to the Embarcadero Freeway at Howard Street.
2. When the Southern Freeway was completed, in approximately five years, it was proposed to restudy the need for a freeway through the western corridor.

3. In the meantime, modifications should be made to existing boulevards and major thoroughfares to improve their traffic-carrying capacity, without converting them into freeways.

1. The Federal Interstate Highway System should be routed over an existing or approved freeway route, such as James Lick Freeway or the Southern Freeway and its extension.

5. If a Western Freeway later should prove to be necessary, it was recommended that it follow substantially the Wilbur Smith Alternate C-Modified series of routes.

On Lincoln Way and Fulton Street it was proposed to avoid taking frontage property or park property by using a depressed freeway between retaining walls with cantilevered overhangs to accommodate the local service street. These one-way drives, besides connecting with Park-Presidio Boulevard, would connect to Fell Street and to Oak Street at the eastern end of the Park Panhandle.

No recommendations were made in the majority report on the Pacific Heights Tunnel or any other project in the northwestern corridor.

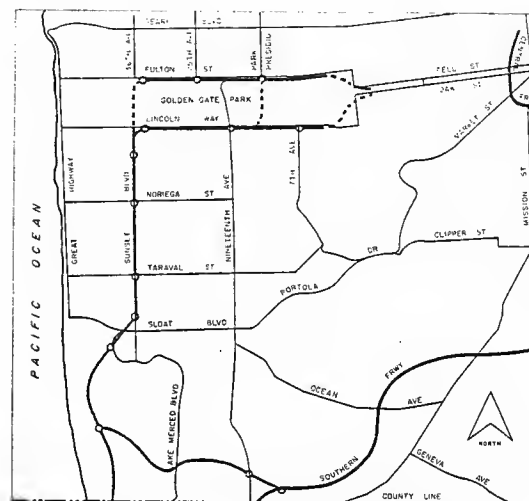
THE MINORITY REPORT

Committee members Burt Edelstein, Oscar H. Fisher, Jr., and Lou Jolly submitted a separate minority report in which a new Western Freeway was recommended, which followed essentially the Alternate A-Modified route of the Wilbur Smith report. It also recommended that an O'Shaughnessy Parkway be built instead of the Crosstown Freeway, and recommended other parkway routes that coincided with those on the 1951 Trafficways Plan.

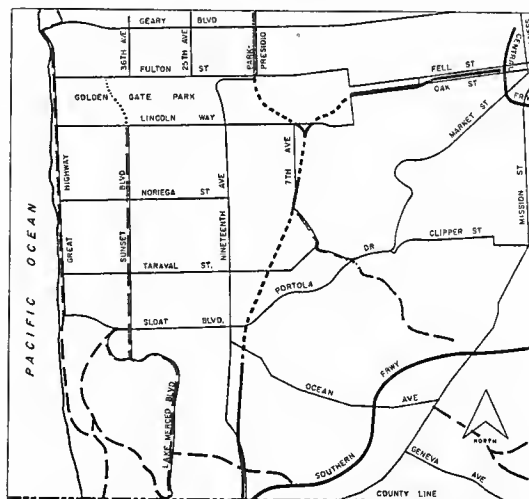
In their report these members emphasized: 1. the lower accident rates on freeways; 2. the higher carrying capacity of freeways; 3. the advantages of freeways in removing congestion from city thoroughfares; 4. the fact that San Francisco traffic volumes have shown an average annual increase of approximately four per cent; 5. the considerable increases in traffic entering and leaving San Francisco in the last few years; 6. the predominance of San Franciscans in congested traffic on main thoroughfares; 7. the need to plan the city's freeway network as one complete and continuous system.

The minority report recommendations included:

1. Completion of the Southern Freeway and its extension to the Embarcadero Freeway.
2. Construction of the Hunters Point Freeway.
3. Acceptance of the necessity of a Western Freeway on the Alternate A-Modified alignment, with further underground (cut-and-cover vehicular subway) construction beneath Junipero Serra Boulevard between St. Francis Circle and Ocean Avenue.
4. Provision of right-of-way funds to purchase properties as they become available in project areas.



MAYOR'S FREEWAY COMMITTEE
WESTERN CORRIDOR
MAJORITY REPORT



MAYOR'S FREEWAY COMMITTEE
WESTERN CORRIDOR
MINORITY REPORT

FREEWAY ROUTES REVIEWED

This reappraisal compares six alternate freeway networks. As these networks have routes in common, the routes are described before each network as a whole is discussed.

THE WESTERN FREEWAY

Networks 10-40-80

This route would be considerably different from the project outlined in the current Trafficways Plan.

A landscaped depressed freeway needing little additional right-of-way would supplant Junipero Serra Boulevard from the county line to Ocean Avenue (1.4 miles). Existing local service streets would continue to serve as such and principal streets would cross on bridges. Beneath Junipero Serra Boulevard between Ocean Avenue and St. Francis Circle there would be a vehicular subway (0.4 miles) so that the complex street traffic movements of Ocean Avenue, Portola Drive, Sloat Boulevard and West Portal Avenue would be undisturbed. Its presence would not be visually apparent. A brief open-cut section for access ramps would connect the subway with a tunnel under Golden Gate Heights which would extend from Wawona Street to Laguna Honda Boulevard near Clarendon Avenue (1.1 miles). From this point, a depressed freeway between retaining walls and located between Sixth and Seventh Avenues would continue to Golden Gate Park (0.9 miles). One branch via a cut-and-cover subway would cross the park to the Park-Presidio Freeway (0.7 miles). The other branch via a subway under park drives would pass Kezar Stadium to the tier of blocks on the south side of the Park Panhandle (0.6 miles). A depressed freeway would border the Park Panhandle on the south, occupying the Oak Street frontage lots. East of the Panhandle it would occupy parts of the blocks between Fell and Oak Streets to a connection with the existing Central Freeway (1.5 miles).

Network 30

The Western Freeway would be the same as in Networks 10, 40 and 80 except that a tunnel (0.9 miles) under Mount Sutro and Parnassus Heights would be substituted for the portion from Laguna Honda Boulevard to the Park Panhandle.

This change would result in two long tunnels between St. Francis Circle and the Park Panhandle, with a 500-foot long "strip of daylight" separating them in the Laguna Honda canyon. Because of the steepness of the hills in this area and the short open distance between portals, it would be necessary to place the junctions for the Laguna Honda Boulevard ramps within the tunnels.

THE CENTRAL FREEWAY

Networks 10-40-80

The Central Freeway would cross Van Ness Avenue near Turk Street, proceed below grade near Larkin Street and continue north as a depressed freeway crossing Van Ness Avenue again to Greenwich and Franklin Streets (1.8 miles).

Network 30

A minimum extension would carry the Central Freeway across Van Ness Avenue near Turk Street and connect with Post and O'Farrell Streets (0.5 miles).

GOLDEN GATE FREEWAY

Networks 10-80

This freeway could connect the Embarcadero Freeway at Broadway to the Richardson Avenue approach to the Golden Gate Bridge via an elevated single deck structure along The Embarcadero and North Point Street, a tunnel under Russian Hill (0.6 miles), and a depressed road near Greenwich Street west of Van Ness Avenue (1.2 miles).

Network 40

This route would be the same as Networks 10 and 80, except that it would extend only from the Embarcadero Freeway to a junction with the Central Freeway and the Tiburon Bridge approach near Greenwich Street west of Van Ness Avenue. No freeway west of this point to the Golden Gate Bridge would be built under Network 40.

PARK-PRESIDIO FREEWAY

Networks 10-40-50-80

The existing six-lane boulevard would be converted into

a six-lane depressed landscaped freeway with overpasses at principal cross streets.

THE PRESIDIO HEIGHTS TUNNEL ROUTE

Network 30

This single route (2.6 miles) would substitute for the Golden Gate Freeway. Central Freeway and Park-Presidio Freeway. A tunnel 0.5 miles long under Anza Vista would extend from Fulton Street to the Geary Expressway and another tunnel of the same length would extend under Presidio Heights from California Street to a point opposite Lombard Street in the Presidio. A full freeway interchange would be necessary at the junction with the Western Freeway near Baker and Fell Streets. Access ramps would be located at the depressed freeway section between Presidio Avenue, Geary Expressway, Lyon and California Streets. In the Presidio, the route would traverse an area now occupied by temporary structures, would connect directly with the Golden Gate Bridge approach and provide ramp access to Lombard Street.

TIBURON BRIDGE

Network 40

The California State Division of San Francisco Bay Toll Crossings has taken the position that another bridge from San Francisco to Marin County will be needed within ten years. The Golden Gate Bridge and Highway District engineering consultant pointed out in a recent report the possible need for a second Marin Crossing in the foreseeable future. However, a recent study by the Department of City Planning, based on data provided by the Bridge and Highway District and by the San Francisco Bay Area Rapid Transit District, concluded that a second bridge to Marin County would not be needed by 1975, provided rapid transit to Marin County were in operation and provided arrangements are made to use four lanes on the bridge in the peak direction of flow.

While it is questionable that a second bridge to Marin County should be an actively considered project in the 1975 trafficways program, it has been included in one network for comparative purposes.

MISSION FREEWAY

Network 80

The Mission Freeway has been included in the Master Plan since 1945. It is not a part of the State Highway System and, in recent years, it has not been included in the city's annual six-year Capital Improvement Program. It has, however, been given consideration in current studies by inclusion in Network 80.

The Mission Freeway would start at the intersection of San Jose Avenue and the Southern Freeway and would utilize the existing Bernal Cut roadway of San Jose Avenue with little change. From the north end of Bernal Cut, it would be parallel to and east of Mission Street on an elevated or side-hill structure to a junction with the Central Freeway.

CROSSTOWN FREEWAY

Network 80

The Crosstown Freeway has been dropped from consideration as a freeway as the predicted traffic volumes can be accommodated conveniently by an improvement similar to that which was made to the Market-Portola route. (Such an improvement would include extending Bosworth Street to a connection with the Southern Freeway and an underpass at Portola Drive.)

SUNSET FREEWAY

Network 50

This is similar to the Alternate C route of the Wilbur Smith report on the Western Freeway. It is designed as a perimeter route which would go around the West of Twin Peaks district but bisect the Sunset district. At the county line, this route would connect with a Skyline Freeway in San Mateo County and would involve a 1.3-mile stretch of freeway at grade which would be in essence a reconstruction of the existing Skyline Boulevard through the Lake Merced and Harding Park area. A vehicular subway 0.6 miles long would carry the freeway under a perimeter street of the Country Club Acres subdivision and under Sloat Boulevard to emerge

in the Sunset Boulevard parkway strip. Sunset Boulevard would be converted into a freeway for 1.7 miles to Golden Gate Park with interchanges at Taraval, Noriega and Judah Streets. Other streets would cross the freeway on bridges. It would be largely a depressed section with landscaped side slopes. With three traffic lanes in each direction, the roadway would occupy approximately the same area as the present park drives.

LINCOLN-FULTON FREEWAY

Network 50

The Lincoln-Fulton Freeway would consist of a pair of three-lane, one-way, depressed freeways separated by Golden Gate Park. To minimize the acquisition of residential frontage properties on Fulton Street and Lincoln Way, or having to take a strip of Golden Gate Park, the freeways would be depressed within retaining walls and partially roofed over for the support of either a ten-foot width of park land or one lane of the surface roads that would be needed to serve the Fulton Street and Lincoln Way frontages. The Lincoln Way portion would be 1.1 miles long and the Fulton Street portion 1.8 miles long. Two cross-park tunnels, one (southbound) from Fulton Street to Sunset Boulevard and the other (northbound) from Lincoln Way to Park-Presidio Boulevard, would connect these one-way freeways. Each would be 0.7 miles long.

Two vehicular subways, each with three lanes of one-way traffic, would be put under Golden Gate Park drives (one 0.2 miles long and the other 0.6 miles long) to connect with cantilevered depressed sections along Fell and Oak Streets, bordering the Park Panhandle. East of the Panhandle the freeway would be the same as the Western Freeway in Networks 10, 40 and 80.

PACIFIC HEIGHTS TUNNEL

Network 50

From the existing terminus of the Central Freeway at Franklin Street and Golden Gate Avenue, this route would consist of an interchange area (0.3 miles) leading to a tunnel

portal near O'Farrell and Franklin Streets; two parallel bores of three lanes each (1.6 miles); an interchange near Richardson Avenue and Lombard Street; and a depressed freeway along Richardson Avenue to the Golden Gate Bridge approach. Connections with surface streets would be provided at Bush and Pine Streets and, possibly, at Broadway.

BROTHERHOOD WAY FREEWAY

Network 50

Since the Sunset Freeway would give direct service to Skyline Freeway serving western Daly City and Pacifica but not to Junipero Serra Freeway in San Mateo County, the Interstate System metropolitan loop route, a lateral route from the Sunset Freeway to the Southern Freeway was included in the proposals of the Mayor's Committee to Study Freeways. From an interchange near the entrance to Harding Park golf course, this route would supplant the drive on the west shore of Lake Merced, cross the lake on a bridge and follow the alignment of Brotherhood Way to the Southern Freeway. This could be built as a new parallel route, or the existing parkway drives could be converted into a freeway. This route would be 2.3 miles long, most of it freeway at grade.

Approved Freeways

The Southern Freeway from Junipero Serra Boulevard to James Lick Freeway is under construction, and final plans are being drawn by the State for its extension north to Army Street.

The Embarcadero Freeway from the Bay Bridge to Broadway is already built, and plans are being prepared by the State for its extension south to Army Street.

The Central Freeway from James Lick Freeway to Turk Street is already built.

The Park-Presidio Freeway and the *Golden Gate Freeway* are already built within the Presidio.

The Hunters Point Freeway from the county line just east of Candlestick Park would tunnel under the Hunters Point ridge to join the Southern Freeway extension near Evans Avenue.

Bay Area Freeways

By J. P. SINCLAIR, Assistant State Highway Engineer



"Routes, Roads and Rolling Wheels" is not the title of an "adult western," but a new 3-R twist to a chapter heading on highway transportation in the social studies text of California's fourth graders.

In other elementary classrooms, students are discussing articles in the April 5, 1961, issue of "Junior Scholastic" magazine about the impact of change on our communities; the problems of population, housing, transportation, greenbelts, urban renewal and suburban development.

President Kennedy has stressed the need for all citizens, all levels of gov-

ernment and for all business and industry to plan for future growth on a coordinated basis. Recently, at M.I.T., scientists from 30 nations met to discuss similar problems on a global basis prompted by the effects of tech-

nology and population explosions in a shrinking world community.

These considerations are not removed from the subject at hand—the vital role of freeways today. Since freeways are planned to meet condi-

*Portola School
April 3, 1961
Los Altos, Calif.*

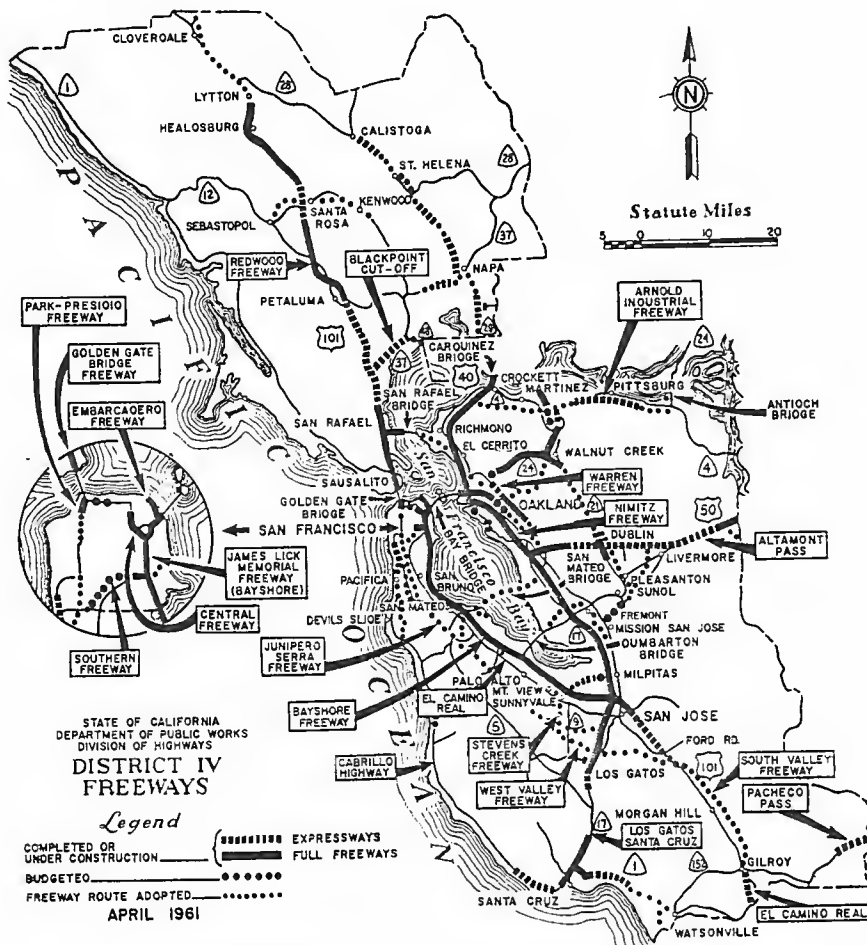
*Dear Sirs:
I am making a report about
Routes, Roads and Rolling Wheels. I
would like to have pictures of
road signs.*

*Thank you.
Curt Heskett*

Looking north at construction operations at Greenbrae on U.S. 101. The new off-ramp bridge connection to San Quentin and the Richmond-San Rafael Bridge is located right foreground. The old bridge is being removed at the center.

A letter typical of the many received from young school children requesting information on same phase of the highway program for projects they are doing in class, this one from Curt Heskett at Los Altos.





A map showing the current status of freeways in the Bay Area.

tions 20 years hence, the best estimate of the future is basic to freeway planning. The young and the not-so-young must think in terms of the future; the young, because they will inherit our freeways and, hopefully, benefit from our experience; the not-so-young, because action is imperative. To procrastinate means chaos.

Freeway Impact

District IV is charged with planning, designing, constructing and maintaining San Francisco Bay Area freeways. The rapid development of our freeway system has raised immediate questions regarding community values and has focused attention on the considerable impact of freeways. This has dramatized the gap between freeway planning and other aspects of community planning. In turn, the various cities, counties and civic groups have responded by dusting off old, and implementing new comprehensive

long-range plans to channel explosive growth into orderly patterns.

The policies and procedures established by the California Highway Commission for route selection and freeway design are directed at obtaining a maximum of community involvement. Studies are announced, alternative routes are presented, and detailed plans are reviewed through a continuing series of local public meetings and discussions with community planners.

It is during this three to five-year process that the freeway is integrated with all aspects of present and predicted area development. Route recommendations and design features are considered in light of the intangible and aesthetic, as well as the functional and economic factors which are brought out. The continuing re-examination of changing conditions as a basis for planning is essential. These plans become tomorrow's realities

which in turn influence subsequent growth patterns.

The following review of construction progress and planning activities detail one facet of Bay Area growth.

U.S. 40—San Francisco to Carquinez Bridge

This important link of Interstate 80 was completed in August, 1960, when the portion of the Eastshore Freeway between El Cerrito Overhead and Jefferson Avenue in Richmond was opened to traffic. Completion of 12 major projects, including the new Carquinez Bridge and Crockett interchange, now provide a minimum six-lane, high speed bypass to replace the undivided highway formerly traversed by eastshore commuters between Oakland and Vallejo.

The last link between El Cerrito Overhead and Jefferson Avenue included construction of a direct connection to Hoffman Boulevard, State Sign Route 17, in Richmond and diamond interchanges at Central Avenue and Carlson Boulevard. A detailed account of this \$5,313,000 project appeared in the July-August 1960 issue of this magazine.

During 1960, functional planning was added between Ridge Road in San Pablo and Crockett, and sign panels were installed between Richmond and Crockett. A blocked-out metal beam median barrier was installed between the Distribution Structure and El Cerrito Overhead.

A \$39,000 contract was recently awarded for landscaping the Crockett interchange and Carquinez Bridges and \$280,000 has been budgeted for landscaping the freeway between El Cerrito Overhead and Jefferson Avenue.

The major U.S. 40 project presently under construction is the Bay Bridge reconstruction, being financed by toll bridge funds. This work includes rebuilding of the approach ramps and the Bay Bridge itself to carry five lanes of westbound traffic on the upper deck with eastbound traffic on the lower deck. This work is being administered by the Division of San Francisco Bay Toll Crossings. Also under construction is the widening of the south side of the Toll Plaza. The contract, also financed by toll bridge funds, will provide 17 lanes through

the Toll Plaza eastbound. As a part of this \$515,000 project, the eastbound toll booths are being remodeled so that all collections will be made from the driver's side.

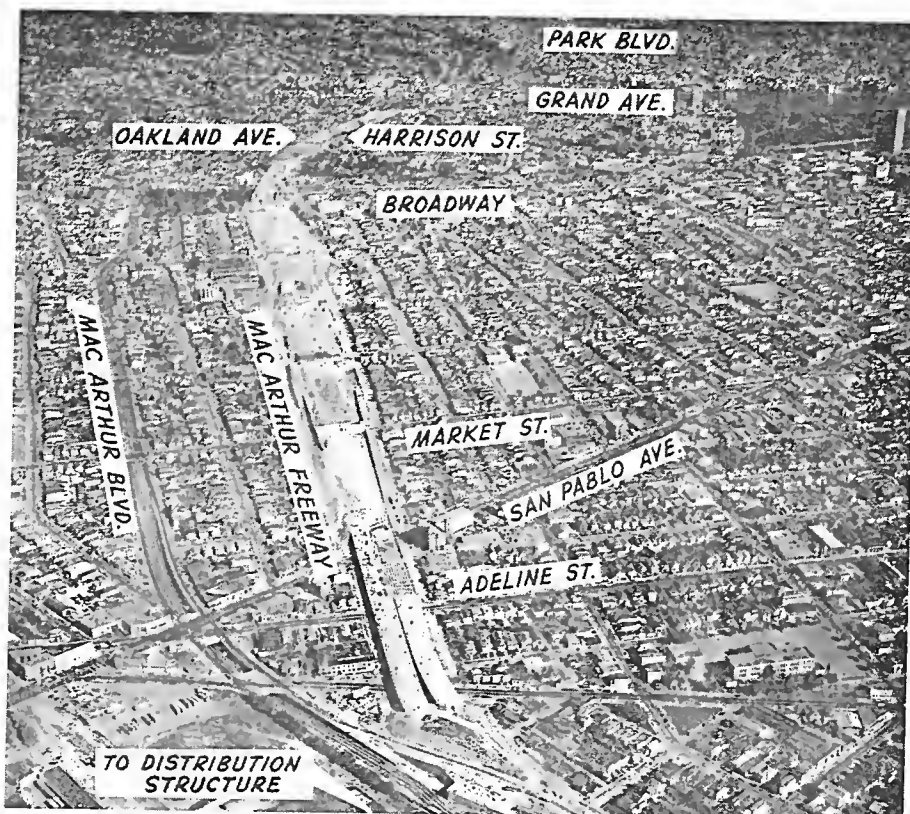
U.S. 50—MacArthur Freeway

Work is in progress on four of nine MacArthur Freeway projects and a fifth contract is expected to be advertised this summer. This section of U.S. 50 between the Distribution Structure in Oakland and Castro Valley is being constructed as an eight-lane interstate facility.

The first section that can be used by traffic consists of three projects, expected to be completed in February 1962, between the Distribution Structure and Grand Avenue. Construction on the first unit between the Distribution Structure and Market Street was started in February of 1960. This project, estimated to cost \$3,113,000, includes one interchange and two undercrossings. The Adeline Street undercrossing is nearly 1,100 feet long and spans four streets. The work is being done by C. K. Moseman and Co.

The second unit let to contract is from Broadway to Grand Avenue. Guy F. Atkinson is the contractor on this \$4,383,000 project, which includes a modified diamond interchange with additional connections in the vicinity of Oakland Avenue and Harrison Street. Structures are provided for the Broadway-Richmond Boulevard, Oakland Avenue and Chetwood Street undercrossings. Embankment is being placed on the adjoining unit of construction between San Pablo Avenue and Webster Street.

The third unit will close the gap between the projects mentioned above. Peter Kiewit Sons Company started this \$4,045,000 project in August, 1961. The future directional interchange between MacArthur and Grove-Shafter freeways is included. At this time, only the substructures of the interchange spans will be constructed since the Bay Area Rapid Transit District has indicated a desire to occupy the median of the Grove-Shafter freeway and the matter is currently under discussion. However, nine additional structures are being



The MacArthur Freeway under construction, looking east from above the San Pablo Avenue Underpass.



U.S. 101 in Marin County looking south toward San Rafael.

destination surveys are now being evaluated for the unit between the Ignacio Wye interchange and Atherton Avenue in Novato.

About 1,000 trees, mostly redwoods, are being planted as part of a \$62,000 landscaping project on the completed freeway in the vicinity of Washington Avenue in Petaluma.

U.S. 101—Petaluma to Mendocino County Line

By 1957, an 18.5 mile section of freeway was completed from south of Petaluma to the southerly city limits of Santa Rosa. Within the City of Santa Rosa the existing expressway has been in use for many years. Studies for the conversion of this facility to an initial four-lane, future six-lane full freeway are well along and rights of way are now being appraised and acquired.

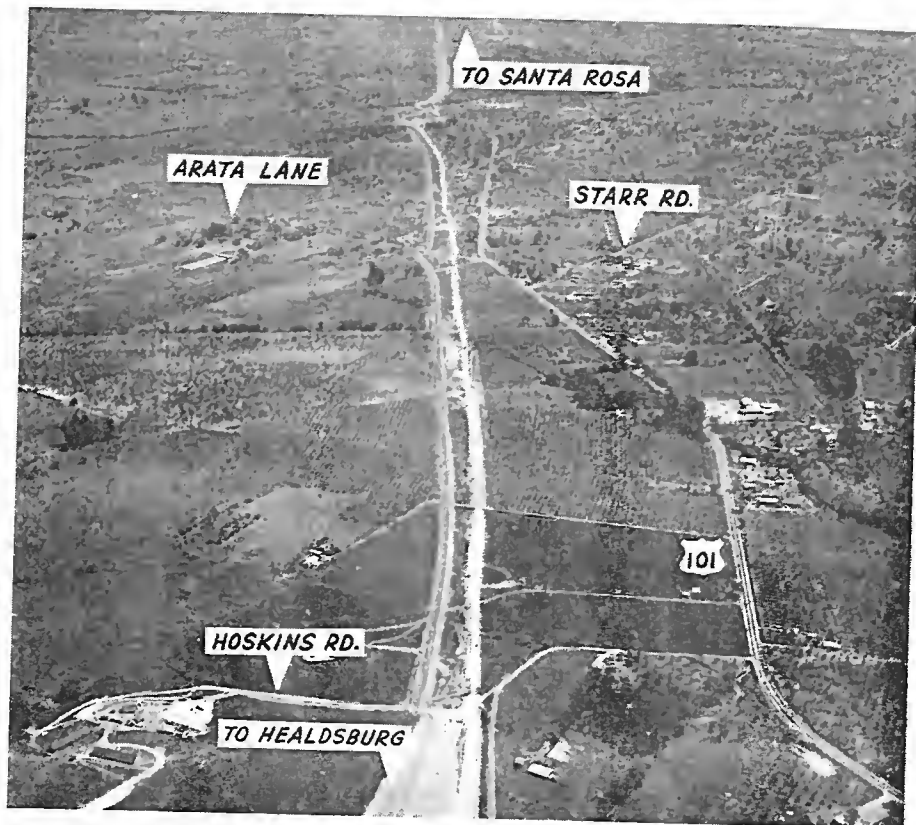
Appraised 16 miles of freeway from the north city limits of Santa Rosa to Lytton will be in use with the completion of two contracts next year. Guy F. Atkinson Company is the contractor on a \$4,386,000 project between Mendocino Avenue in Santa Rosa and Grant Creek. Five interchanges will be constructed between Santa Rosa and Windsor, and grading will be done between Windsor and Grant Creek. The second contract includes paving the graded portion between Windsor and Grant Creek and the construction of frontage roads and interchanges at Windsor and Grant Street. Ball and Simpson is the contractor on this \$3,110,000 project.

North of the present construction, the Healdsburg Bypass has been completed to Lytton. Guy F. Atkinson Company was the contractor on this \$2,354,000 unit which was opened to traffic last December.

The route north of Lytton to the county line has been adopted. An initial four-lane, ultimate six-lane freeway is being planned for this 18½ miles.

U.S. 101 (Bypass)—San Francisco to Palo Alto (Bayshore Freeway)

Although 26 miles of continuous six-lane freeway has been in use between San Francisco and Palo Alto for several years, the congestion resulting from heavy peak hour traffic dictates further improvements. The



U.S. 101 south of the Healdsburg Bypass, looking southward, showing construction now under way.



The Healdsburg Bypass with the new twin bridges across the Russian River (foreground).

first of these, a widening project in the vicinity of San Francisco International Airport, was completed in April, 1961.

A fourth lane in each direction was added between Broadway in Burlingame and San Bruno Avenue in San Bruno. The added northbound lane begins at Peninsular Avenue. At the Millbrae Avenue interchange, a direct right-turn connection to the southbound freeway was added and remaining ramp outlets were improved. L. C. Smith Company was the contractor for this \$1,662,000 project which included installation of a double blocked-out metal beam barrier between opposing traffic lanes through interchange areas.

The widening has provided considerable traffic relief in the vicinity of San Francisco International Airport and a reduction in travel time between Peninsula communities and San Francisco.

Also under way is a landscaping project between 16th Avenue in San Mateo and San Carlos. Approximately \$71,300 is being expended to provide

trees, shrubs and ground cover on the approaches to structures. A similar project was completed in July of last year between Harbor Boulevard in Redwood City and University Avenue in Menlo Park. Cost of this planting was approximately \$194,000. Another \$150,000 has been budgeted for landscaping the section between Spruce Avenue in Redwood City and University Avenue.

A \$41,000 contract for the installation of cable-chain link median barrier was completed in December between Third Street in San Francisco and Sierra Point Overhead. Further extension of the barrier now being planned will provide 17 miles of cable-chain-link median barrier from Sierra Point to the Redwood Creek Bridge in Redwood City.

U.S. 101 (Bypass)—Palo Alto to San Jose (Bayshore Freeway)

Two contracts in Santa Clara County are expected to be completed in December, 1961, climaxing several years of intensive construction effort to provide a continuous freeway from San Jose to San Francisco.

The six-lane facility was extended southerly from the San Mateo County Line to Stierlin Road in Mountain View in May of last year. Interchanges were provided at Embarcadero, San Antonio and Middlefield Roads on this 4.4 mile, \$3,391,000 project constructed by L. C. Smith and Concar Ranch and Enterprises.

During 1958 and 1959, interchanges were completed at Moffett Boulevard and at the intersection of U.S. 101 (Bypass) and State Sign Route 9 (Mountain View-Alviso Road). A contract connecting these interchanges and extending the freeway southerly to Fair Oaks Avenue is currently in progress. Interchanges are being constructed at Reingstorff Avenue, Stierlin Road, Ellis Street, Mathilda and North Mathilda Avenues. The work, being performed by L. C. Smith and Concar Ranch and Enterprises, includes construction of a freeway section on State Sign Route 9 from Bayshore Freeway to 0.2 mile east of Borregas Avenue.

Other features of this \$4,518,000 contract are the improvement of existing channel facilities of the Santa Clara County Flood Control District and realignment and channel widening on Guadalupe River at the southerly end of the project. The cooperative project for the channel improvements provided a source of material for the freeway with channel right of way being furnished by the Flood Control District.

Allen M. Campbell Co. is constructing the last section of Bayshore Freeway in this area. This 6.1 mile contract provides a four-lane freeway between Brokaw Road and the future Guadalupe Parkway and six lanes from there to Morse Avenue where it joins the section mentioned above. This work, costing approximately \$5,670,000, provides cloverleaf interchanges at Fair Oaks Boulevard, Lawrence Station Road, San Tomas Aquinas Boulevard and De La Cruz Boulevard.

Southerly of this portion, a contract was completed last May between Brokaw Road and Taylor Street in San Jose. Included in this \$4,317,000 project was the extension of State Sign Route 17 as a freeway to First Street



The Bayshore Freeway (looking south) near the International Airport where a fourth lane in each direction has recently been completed.

in San Jose. Thirteen structures were built including those within the cloverleaf interchange at the intersections of Nimitz, Sign Route 17 and Bayshore Freeways. Interchanges were also provided at North First Street, existing Sign Route 17 and old Bayshore highway. These projects were discussed in detail in an article on San Jose Freeways in the July-August 1960 issue of this magazine.

Approximately 5,000 shrubs, 400 trees and ground cover were planted by Rudolph Watson between Coyote Creek and Santa Clara Street in San Jose at a cost of \$65,000. Funds in the amount of \$300,000 have been budgeted for extending landscaping north on Bayshore to Brokaw Road and for planting on Nimitz and Sign Route 17 Freeways between Bascom Avenue and old Bayshore Highway.

U.S. 101 (Bypass)—San Jose to U.S. 101 of Ford Road (Bayshore Freeway)

An expressway has been in operation within these limits since 1947. Design studies are now under way for conversion to an ultimate eight-lane freeway. Public meetings have been held and a freeway agreement has been executed with the City of San Jose for that portion of the highway within the city limits. Agreements with the county covering other portions are pending.

Funds in the amount of \$850,000 are budgeted for grading, paving and structures at Tully Road. This project will provide a full four quadrant cloverleaf interchange with collector roads and is expected to be advertised this summer. Another project will add facilities for turning movements at the McKee Road interchange constructed in 1957.

U.S. 101 in San Francisco

Within San Francisco, U.S. 101 traverses city streets, the Central Freeway and portions of the James Lick Memorial and Southern Freeways. Construction and design activities, except for landscaping and minor projects, are confined at present to the Southern Freeway. Planning studies are currently under way by the City for reappraisal of the ultimate freeway system in San Francisco.



An aerial view of a capacity crowd at the San Francisco Giants' Candlestick Park, with the over-water section of the Bayshore Freeway curving south around Sierra Point toward South San Francisco and the Peninsula communities.

Work is in progress on repairing the expansion joint metal plates on the Marina Viaduct approaches to the Golden Gate Bridge. This \$160,000 contract is being performed by the Independent Iron Works. Bids were opened April 26 for resurfacing Van Ness Avenue (U.S. 101) between Lombard Street and Golden Gate Avenue estimated to cost approximately \$150,000.

Central Freeway

Two units of the Central Freeway have been open to traffic between James Lick Freeway and the vicinity of the Civic Center since April, 1959.

This past year, approximately 750 eucalyptus trees, 3,000 shrubs and 38,000 ivy plants were set out between Valencia and Turk Streets by A. S. Brown Landscaping Co. under a \$72,300 contract.

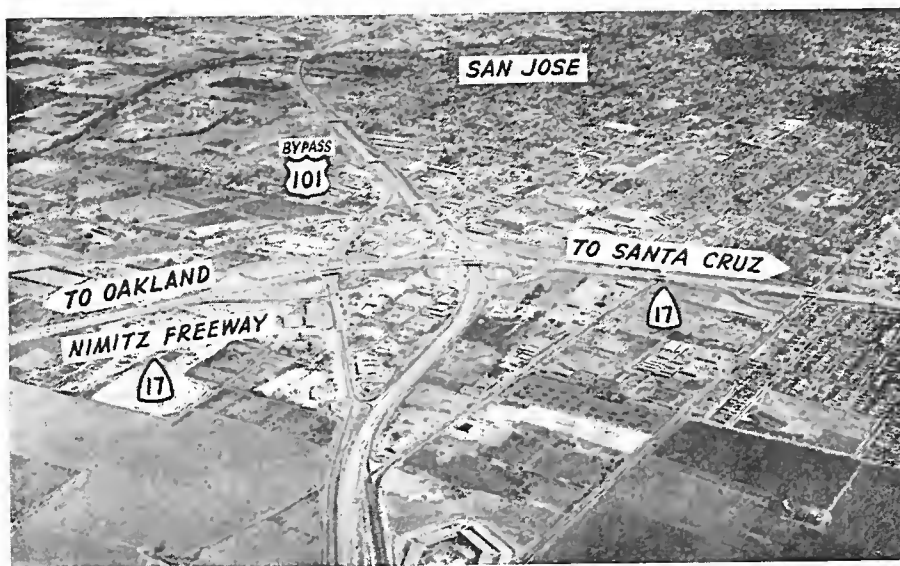
James Lick Memorial Freeway

Work on this six and eight-lane freeway in the past few years has consisted of landscaping, erosion control, installation of median barriers and the

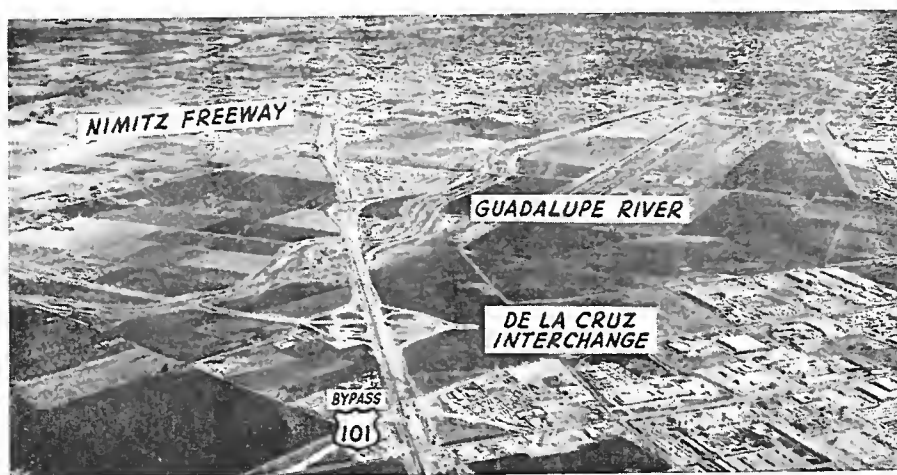
construction of direct interchange connections to the Southern Freeway at Alemany Boulevard. Although part of U.S. 101 from the Division Street Distribution facilities to the Southern Freeway, James Lick Memorial Freeway extends from the San Francisco-Oakland Bay Bridge to the San Mateo County Line and is used by 150,000 vehicles a day.

Minor projects completed during the past year included resurfacing and reconstruction of curbs and gutters in the vicinity of Alemany Rotary interchange at a cost of approximately \$20,600. A blocked-out metal beam median barrier was installed between Army Street and Third Street in two contracts at a total cost of approximately \$100,000. An \$11,700 landscaping project between the 18th Street and 22nd Street pedestrian overcrossings was also completed.

A project will soon be advertised for functional planting along a 1.35 mile section of James Lick Freeway between Paul Avenue Undercrossing and Powhatan Avenue just north of



Looking south along the Boyshore Freeway through San Jose.



Looking south toward San Jose from above the Boyshore Freeway under construction.



Boyshore Freeway construction in the Mountain View area with Moffett Field indicated (left foreground).

the Southern Freeway Interchange, for an estimated cost of \$89,500.

Southern Freeway

The Southern Freeway extends westerly from the James Lick Memorial Freeway to a proposed connection with the future Junipero Serra Freeway in Daly City and forms a part of U.S. 101 to San Jose Avenue. The first unit was opened to traffic in July, 1960, when Guy F. Atkinson Co. completed a \$7,565,000 interchange project at James Lick Freeway. Direct connections are provided for all turning movements and provision has been made for future freeway extension east and northerly to the Embarcadero Freeway. This contract, financed partly with \$1,450,000 of city funds, included reconstruction of Bayshore Boulevard. The Highway Commission has under consideration a proposed routing for a future connection with the Embarcadero Freeway.

The second unit between Milton Street and the completed interchange, is being constructed by Charles L. Harney, Inc., with \$4,273,000 allotted for providing 1.1 miles of six-lane, future eight-lane, freeway and structures to carry Alemany Boulevard traffic over the freeway in the vicinity of Gaven and Condon Streets. Mission Street and Justin Drive traffic will also be carried over the freeway. A temporary structure has been built to detour Mission Street traffic during construction and the city is participating in the cost of relocating a major sewer within the limits of the contract.

Funds have been budgeted for two additional units of the Southern Freeway and design studies are under way. A one and three-tenths mile, \$6,000,000, project between Ocean Avenue and Mission Street will be advertised this summer. It is expected that the 1.8 mile section between Orizaba Avenue and Ocean Avenue, estimated to cost \$4,600,000, will be ready for contract early next year.

Funds have been budgeted for a \$188,300 landscaping project between Boylston Street and the James Lick Freeway and studies are in progress for additional landscaping.

U.S. 101—El Camino Real—San Francisco to Ford Road

Minor traffic signal, channelization, resurfacing and widening projects were completed during the past year at numerous locations along this arterial which links Peninsula communities. Approximately \$191,000 was expended on eight projects which were financed in cooperation with the cities concerned.

A 1.2 mile contract in Daly City was typical. Approximately \$94,500 was expended to remove the old street car tracks on Mission Street, construct a median island and install traffic signals. Daly City contributed approximately \$7,400 and the City of San Francisco \$12,600 for this work.

Portions of El Camino Real have previously been widened to six lanes with a median separation and funds have been budgeted for two additional projects. The City of Millbrae is contributing \$140,000 as its share of a \$385,000 project between Taylor Boulevard in Millbrae and Santa Helena Avenue in San Bruno. A 2.7 mile portion between Matadero Creek and University Avenue in Palo Alto will be widened to six lanes by a \$1,330,000 project to which the City will contribute \$440,000. Both of these projects will be advertised in the near future.

Design studies are under way for widening the portion northerly from Millwood Drive in San Bruno to Old Mission Road in Colma.

Public meetings have been held and plans established for widening 13.7 miles between Matadero Creek in Palo Alto and State Sign Route 17 in San Jose. Aerial photographs have been received for planning studies for an interchange at Page Mill Road in Palo Alto. Interchange studies have also been made at San Antonio Road in Mountain View. Construction of interchanges at the major crossings of U.S. 101 is contingent on substantial participation by local agencies.

Plans are being prepared for widening of the remaining three-lane section between Tully Road and Ford Road to a four-lane divided arterial. This five miles is the last remaining section of three-lane highway on U.S. 101 between San Francisco and Gilroy.

U.S. 101—El Camino Real—Ford Road to San Benito County Line

The route was adopted after Commission Hearing in February 1961, for an ultimate eight-lane freeway between Ford Road at the junction of Bayshore and El Camino Real and Thomas Road south of Gilroy. This proposed 25-mile facility will be located east of existing U.S. 101.

Minor interim projects are being constructed within these limits. During the past year, \$25,000 was expended to provide left turn lanes at Church Street and Burnett Avenue in Morgan Hill. Funds in the amount of \$220,000 have been budgeted for resurfacing and reconstructing an eight-

mile section from Madrone Underpass in Morgan Hill to Coyote.

Since 1951, a four-lane divided expressway has been in operation south of Gilroy to the Pajaro River at the San Benito County line.

Embarcadero Freeway

The double-deck Embarcadero viaduct has been in service for two years from the Bay Bridge approaches around San Francisco's financial district to Broadway. Design studies are under way for access ramps to Clay and Washington Streets at an estimated cost of \$1,470,000. Construction is to be correlated with widening of the city streets in order to properly



A frontage road beside the James Lick (Bayshore) Freeway in San Francisco showing ivy ground cover on slopes and shrubbery planting (left) to screen freeway lanes.



The Silver Avenue off-ramp beside the James Lick (Bayshore) Freeway in San Francisco, looking northeast at the three-level interchange for the Southern Freeway crossing. The interchange area has been landscaped with Scotch broom and ivy ground cover. Blocked out metal beam guard rail divides opposing traffic lanes on the freeway.

handle the ramp traffic as a part of the Golden Gateway Redevelopment project now in progress.

The California Highway Commission has under consideration the routing recommended by the San Francisco Board of Supervisors for the southerly extension of the Embarcadero Freeway between Howard Street and the Southern Freeway extension at Evans Avenue. Planning studies are also in progress for the Hunters Point Freeway extending from Evans Avenue to the Bayshore Freeway near the south city limits. The Southern and Embarcadero Freeway extensions are included in State Highway Route 253 added to the system by the 1959 session of the Legislature.

During the past year, parking lots and landscaping have been added under the viaduct. Another project, which received considerable attention

was the \$25,400 viewing area completed in January on the upper deck of the Embarcadero Freeway which provides pedestrian strolling areas and parking for 60 vehicles.

Funds have been budgeted for extending of the Southern Freeway easterly from James Lick Memorial Freeway to meet the proposed Embarcadero Freeway near Oakdale Avenue. This 0.7 mile section is estimated to cost approximately \$5,500,000 and the City of San Francisco is acquiring the rights of way for the project in accordance with state law.

Junipero Serro Freeway (Interstate 280)

Detailed design studies are being made and rights-of-way are being acquired on this Interstate route down the Peninsula from San Francisco to connect with Sign Route 17 at Moor-

park Avenue in San Jose. Fourteen projects are planned to complete this 47 miles of freeway. Interstate 280 follows Sign Route 17 to join Interstate 680 (Nimitz Freeway) at Bayshore in San Jose.

Eight lanes will be constructed between Alemany Boulevard in San Francisco and Eastmoor Avenue in Daly City. From Eastmoor Avenue to Woodside Road near Atherton, eight lanes will be built. Six lanes will be constructed initially on the remaining portion between Woodside Road and Sign Route 17.

Cabrillo Highway (Sign Route 1)— Watsonville to San Francisco

Planning studies have been completed for 5.2 miles of initial four-lane, ultimate six-lane freeway between Watsonville and Rob Roy Junction south of Aptos. Public hearings on this project are scheduled for this summer.

A \$612,000 contract at Capitola is under way by L. C. Smith on the first of a series of projects to convert the existing expressway between Rob Roy Junction and Santa Cruz to full freeway. It includes construction of the 41st Avenue Interchange and a frontage road between South Rodeo Gulch and 17th Avenue.

North of Santa Cruz, construction of two lanes of a future four-lane expressway has been in progress for several years. Two such projects were completed during the past year, jointly financed by the State and the three counties of Santa Cruz, San Mateo and San Francisco under Joint Highway District No. 9. \$844,000 was expended for 1.5 miles of two-lane roadway and 1.7 miles of four-lane expressway from Wilder Creek to 4.0 miles south of Davenport. Four-lane expressway was provided for passing in areas where the terrain creates sight distance problems.

A similar \$393,000 project was constructed between New Years Creek near the Santa Cruz County line and Whitehouse Creek. These projects complete the work of Joint Highway District No. 9 which was established in 1928 for the purpose of building State Sign Route 1 between Santa Cruz and San Francisco.

Funds in the amount of \$550,000 have been budgeted for an initial two-lane replacement of the Tunitas Creek Bridge and approaches. Design is complete and rights-of-way are being purchased for a future six-lane expansion.

Two hundred ten thousand dollars is budgeted for resurfacing portions of the 37 miles between Davenport and Princeton, south of Half Moon Bay.

Design studies are under way to provide a four-lane, ultimate six-lane facility from Half Moon Bay Airport to Skyline Boulevard in Daly City and thence to a junction with Junipero Serra Freeway. Included in this section is the conversion of the existing four-lane expressway between Manor Drive in Pacifica and Skyline Boulevard to a six-lane freeway and a relocation around the Devil's Slide area between Montara and Pacifica for which the freeway routing was established last December.

State Sign Route 1—North of San Francisco

Planning studies for relocation of Sign Route 1 between Manzanita at Richardson Bay, four miles north of Golden Gate Bridge, and Olema, were presented at public meetings. Further consideration of the route has been postponed pending legislative determinations regarding scenic highways.

Work performed during the past several years has consisted of reconstructing roadways and improving drainage facilities. Two such projects were completed in the last year. Nearly \$100,000 was expended between Muir Beach and 5.3 miles south of Olema and \$172,000 was spent to reconstruct and resurface portions of the existing two-lane highway between the Marin County Line and Bodega Bay. Construction has started on a \$150,000 contract for grading and paving a 0.5 mile section north of Jenner. A 1.6 mile project to perform similar work north of Fort Ross has been planned.

Bay Front Freeway

Designated by the 1959 Legislature as State Highway Route 289, this route will be located east of the Bayshore Freeway, extending from San

Jose to a connection with the future Hunters Point Freeway in San Francisco.

Approximately one and one half miles of the route across Brewer's Island at the westerly end of the San Mateo-Hayward Bridge has been adopted and geometric studies for the future interchange at the intersection with State Route 105 are under way.

south of Homestead Road in Cupertino and El Camino Real in Sunnyvale. The remaining 2.4 mile portion between El Camino Real and Bayshore Freeway is being designed on an initial four-lane, ultimate six-lane basis.

An interim four lane arterial project on State Sign Route 9 along the present Mathilda Avenue routing was completed in November from the



Construction on State Sign Route 1 between White House and New Year's Creek in San Mateo County.

This section was established in order to enable planning to proceed in connection with development of Brewer's Island as a planned community.

Stevens Creek Freeway

Design studies are in progress for the new Stevens Creek Freeway between the Junipero Serra Freeway and Bayshore Freeway near Mountain View. The first unit will be a four-lane section 3.1 miles in length between the Junipero Serra Freeway

Southern Pacific Railroad east of El Camino Real to an interchange at Bayshore Freeway in Sunnyvale. The cost of constructing two additional lanes and installing signals and lighting was \$195,000. This section, for which the city purchased rights-of-way, will be relinquished to the city when the Stevens Creek freeway is completed.

The California Highway Commission has authorized development of the existing State Sign Route 9 to a four lane arterial between Azule north of

Junipero Serra

Advance Planning Pays Off
On Interstate Route 280

By JACK O. GRASBERGER, Senior Highway Engineer



In the spring of 1784 Father Junipero Serra laboriously made his way along El Camino Real to pay a last visit to the Mission San Francisco de Asis. No doubt, as he traveled north-

ward along the bay front, he would often gaze westerly toward the beautiful hills which separate San Francisco Bay from the Pacific Ocean. Today, these hills serve as the location for a future interstate highway extending from San Francisco to San Jose and appropriately known as the Junipero Serra Freeway.

The story of this freeway has its beginning during the years following World War I when the mass production of automobiles and development of the San Francisco Peninsula combined to create a major transportation need.

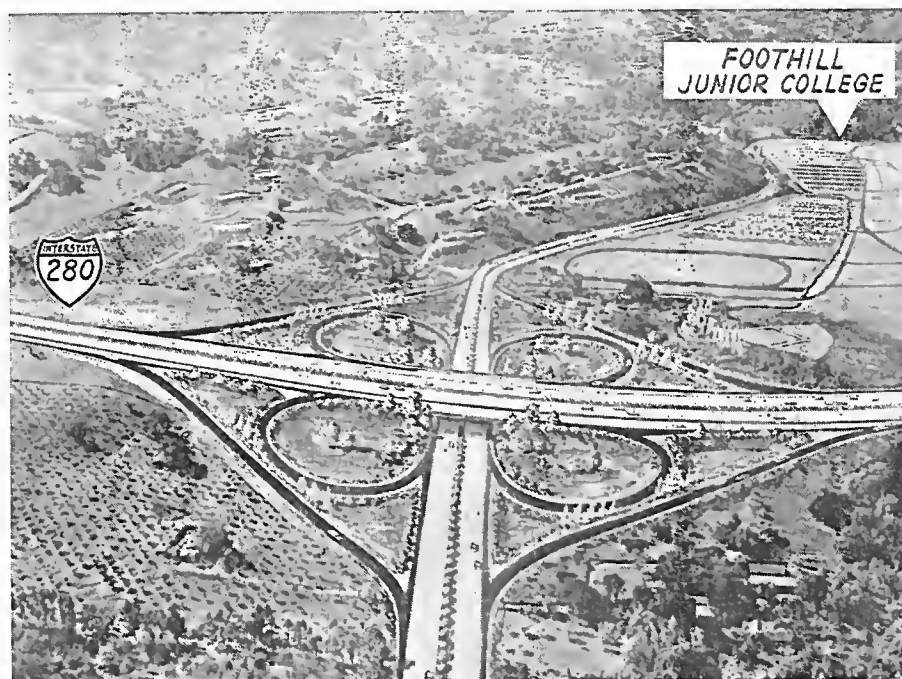
Joint Highway District 10

As early as 1928, the need for an additional arterial highway extending from San Francisco southerly to the San Jose area was recognized. Joint Highway District 10, comprising San Francisco and San Mateo Counties, was created and by 1939, a location for a four-lane highway, to be known as Junipero Serra Boulevard, was planned as far south as the Santa Clara county line. This routing followed what was then the westerly edge of the developed area, generally along the foothills on the east slope of the coastal ridge. The projected right-of-way was delineated with iron pipes, bringing forth a flood of protests by affected towns from Burlingame to Menlo Park.

A seven-mile portion extending as far south as Crystal Springs Road in San Bruno was constructed by 1952, with rights-of-way largely acquired through Millbrae.



BEFORE—Looking SW along El Monte Avenue in the town of Los Altos Hills (see photo below).



AFTER—Retouched photo indicating artist's conception of proposed interchange with an improved (four-lane) El Monte Avenue. The initial location for the Junipero Serra Freeway was modified to avoid conflict with plans for the Foothill Junior College.

During the ensuing years, financial problems and diverse opinions as to the routing and recognition that the scope of the needed highway improvement was of more than only local concern led to the conclusion that further development of this route should be a state responsibility. In 1956, the Legislature included the constructed portion in the State Highway System as Route 237.

The Division of Highways, in cooperation with the U. S. Bureau of Public Roads, was concurrently proceeding with the study of possible routes for the National System of Interstate and Defense Highways authorized by Congress. This route was included as an Interstate route in 1955, and by 1957, the Legislature had in-

cluded new Route 239 in the State Highway System, extending from San Francisco to U.S. Route 101 near San Jose. It is now also designated as Interstate Route 280.

50 Miles of Paper Highway

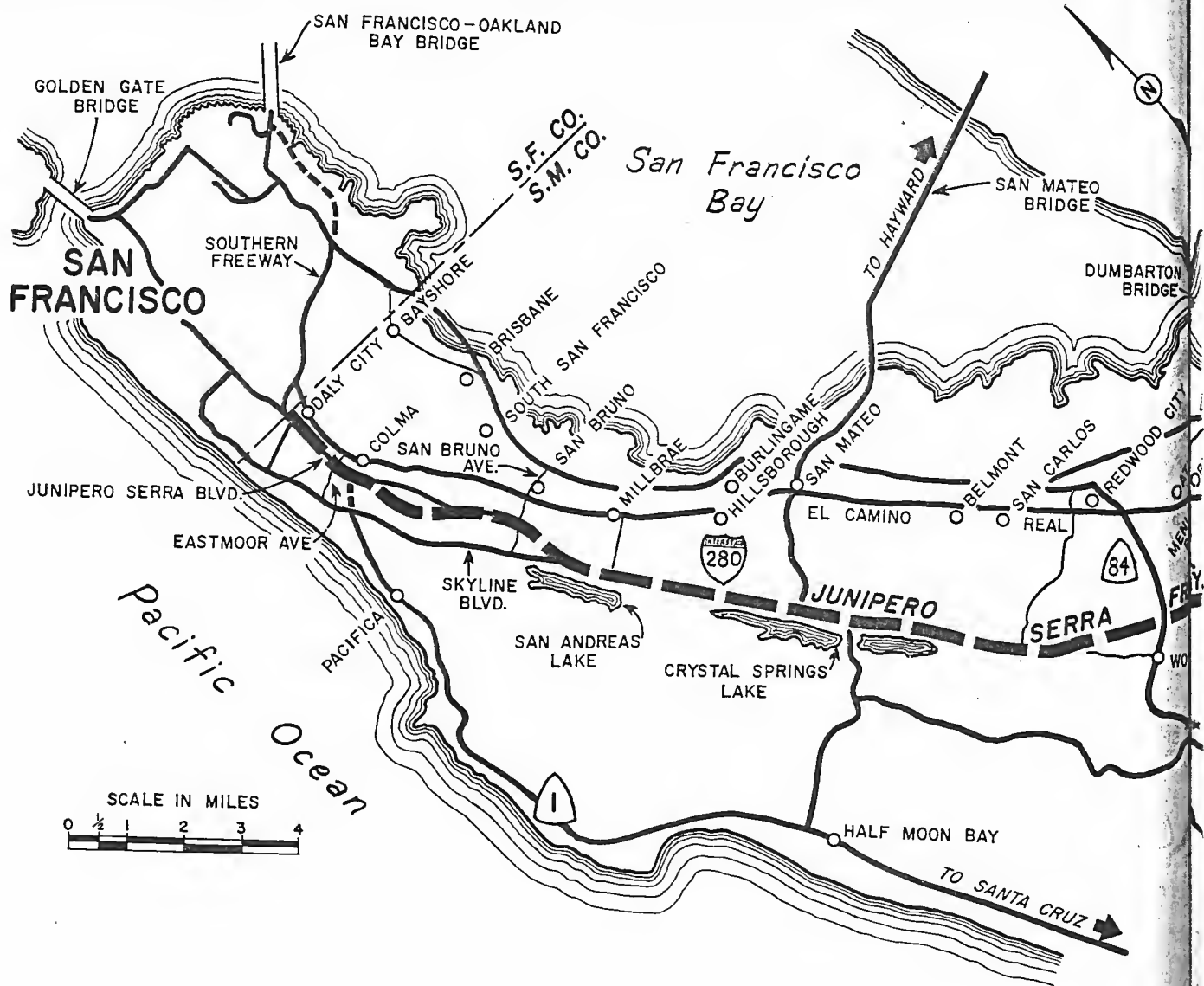
Preliminary planning studies were well along by early 1957. Aerial mosaics and topographic maps at scale $1" = 300'$ had been ordered covering all possible route locations within both San Mateo and Santa Clara Counties. Contour interval was $1" = 10'$.

Two basic locations were developed and referred to as alternates "A" and "B." The "A" alternate followed generally the original location projected for the Junipero Serra Boulevard by the Joint Highway District and was

the most easterly and closest to built-up areas in both San Mateo and Santa Clara Counties. Alternate "B," the more westerly location, followed Skyline Boulevard along the coastal ridge in northern San Mateo County and thence generally along the foothills to the west of alternate "A." Later, additional alternates were developed, mostly to the west and further away from the developed area. These latter studies were made at the request of the cities and counties and certain civic groups.

First Public Meetings

From April through July of 1957, more than 40 public meetings were held with local governmental officials, civic bodies and local community or-



ganizations for the purpose of explaining in detail the studies that had been made. After new studies of additional routings had been suggested and made, district public hearings were scheduled in San Jose and Sunnyvale to discuss alternative locations in Santa Clara County.

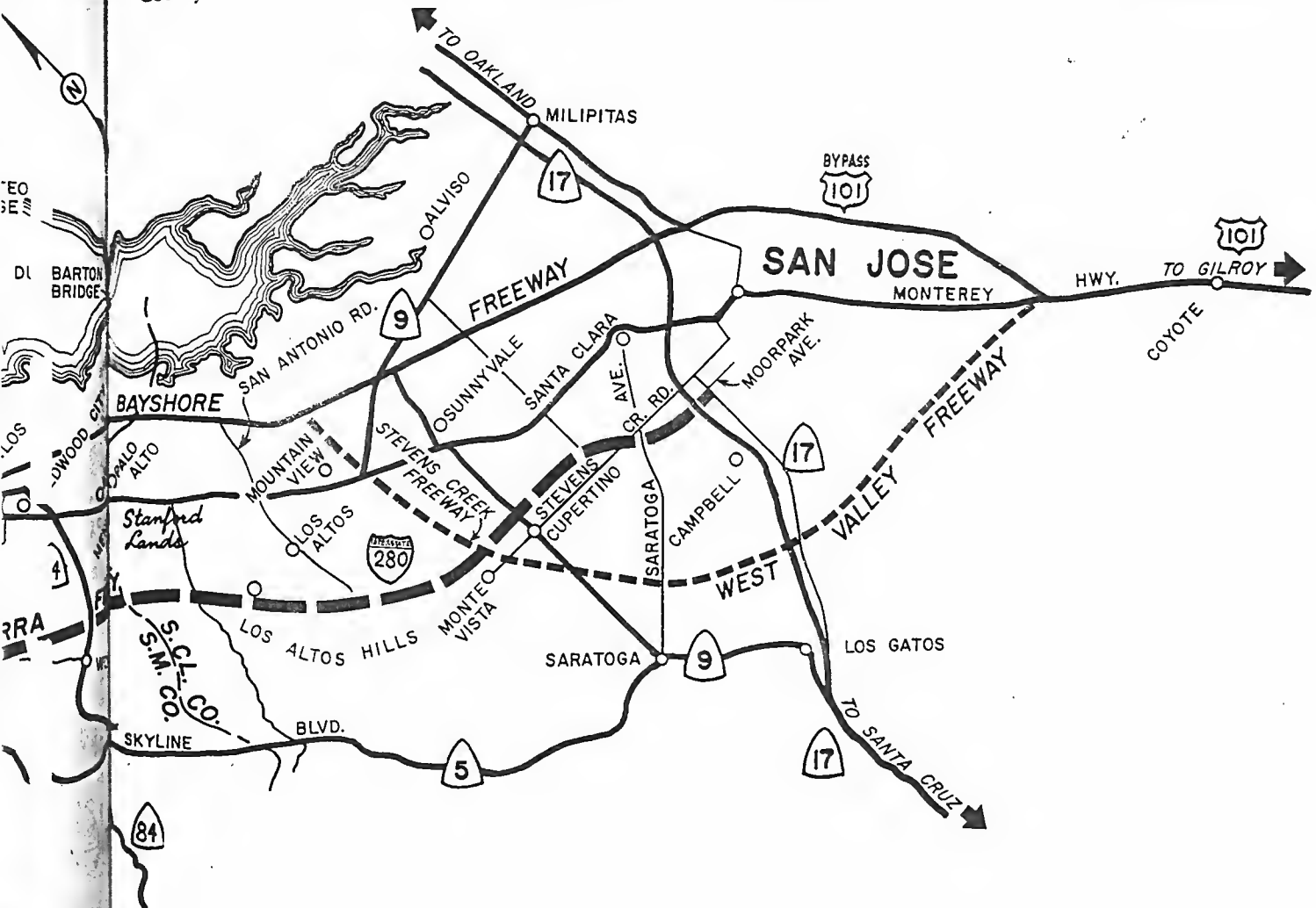
A method of analysis was developed whereby alternative locations were considered as part of a freeway system, including all of the existing or planned major routes in the area. Every effort was made to simplify the analysis for public presentation, but the description of an alternate routing such as the "B-B4-U1-A-" was not unusual for a location within just the northern part of Santa Clara County.

What is now known as the West Valley Freeway bypassing San Jose to the south, and a two-mile length of the Junipero Serra Freeway along Moorpark Avenue in San Jose were adopted by the California Highway Commission on November 25, 1957. At the same time, a southerly extension of the Stevens Creek Freeway was adopted, establishing a continuous location for the West Valley Freeway. A route bypassing San Jose to the south, as intended by the Legislature, had been established. However, only a small portion of the Junipero Serra Freeway routing had been adopted. More than 35 miles of location was still to be determined to the north and through San Mateo County.

Don't Muddy the Waters

By the summer and fall of 1957, District public hearings had been held in San Mateo and Santa Clara Counties. These hearings covered the portion of the route extending from San Bruno to the previously adopted section in Santa Clara County. The local governmental agencies were virtually unanimous in their opposition to Route A, located through the highly developed portions of the peninsula and to the east of Skyline Boulevard. In San Mateo County, Route B, located along Skyline Boulevard, appeared to be most feasible.

A multitude of considerations are necessary in the study and selection of a major route. To properly locate a freeway route, consideration must be





Looking northwest along Purissima Avenue in the town of Los Altos Hills. Hoover Tower on the Stanford University Campus can be seen in the background. Wherever feasible, separate alignment and grades for each roadway with wide median areas for planting will be used.



A view looking northwest along Conondo Road in the town of Woodside. Watershed lands of the City and County of San Francisco in the background. This beautiful valley is only 4 miles west of El Camino Real.

given to both the motorists who will use it and the communities through which it passes. All possible alternate routes are investigated so that the final result will afford the best traffic service at the least possible cost, consistent with minimum disruption to community values.

More than 14 miles of the Skyline route traversed lands of the watershed area owned by the City and County of San Francisco. Domestic water supply for San Francisco and most of the northern peninsula is impounded in San Andreas and Crystal Springs lakes, located just west of Skyline Boulevard.

Originally, water supply was limited to runoff from the watershed lands. As water needs increased, additional water had to be brought in from outside sources as far as the High Sierra, and the reservoirs now serve as terminal storage for the Hetch-Hetchy System, provide for seasonal fluctuations in consumption and protect against water shortages resulting from limited local runoff. This water supply is of very high quality and does not require filtration treatment.

Meetings were held with representatives of the Water Department who were concerned about the danger of pollution or increased turbidity of the water by reason of highway construction activity. At the same time, a citizens committee, representing property owners along Skyline Boulevard, proposed that the highway be located farther to the west and closer to the lake. Such a location would preserve existing homes, but would place the freeway westerly and well below the Skyline ridge, causing severe problems in drainage control, particularly during construction when it was feared that storm runoff would carry mud and debris from the construction down into the reservoir.

Studies were made to determine if storm runoff could be controlled during construction so as not to increase turbidity in the lakes. Cost estimates for an extensive drainage control system were included as part of each alternate, including the one suggested by the citizens committee which encroached deep within the watershed area.

Commission Hearings

In the spring of 1958, public hearings were held by the California Highway Commission in both Santa Clara and San Mateo Counties. The State Highway Engineer recommended a route generally following the Skyline location in San Mateo County and a location through the lands of the Leland Stanford University, acceptable to their Board of Trustees. The location through Los Altos Hills in Santa Clara County was recommended as being in the best public interest.

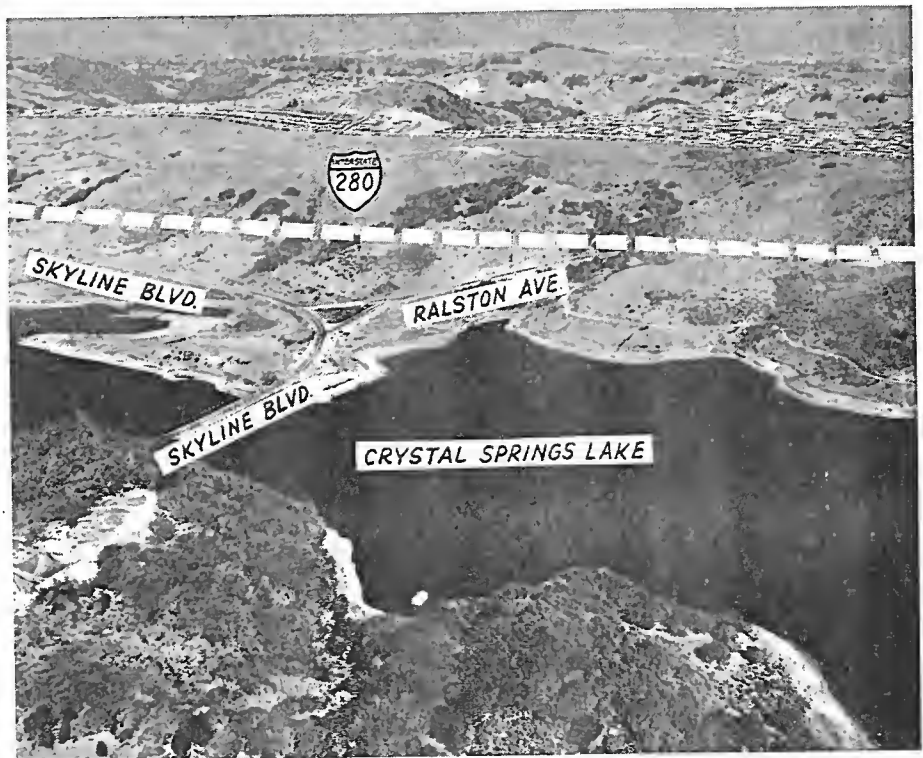
The recommended route represented a modified location over that originally conceived, in terms of better fitting local planning and requiring fewer homes. Actually, an estimated 84 improved properties would be required by this 35 miles of freeway, an amazingly low figure in this rapidly growing suburban area.

After careful consideration of testimony by local governmental agencies, citizens groups and individuals, and subsequent reports by several agencies and groups, the Commission adopted the route recommended by the State Highway Engineer. This location truly represented exhaustive negotiations and considerations with reasonable compromise between the Division of Highways and local representatives and resulted in an unusual degree of concurrence by all concerned.

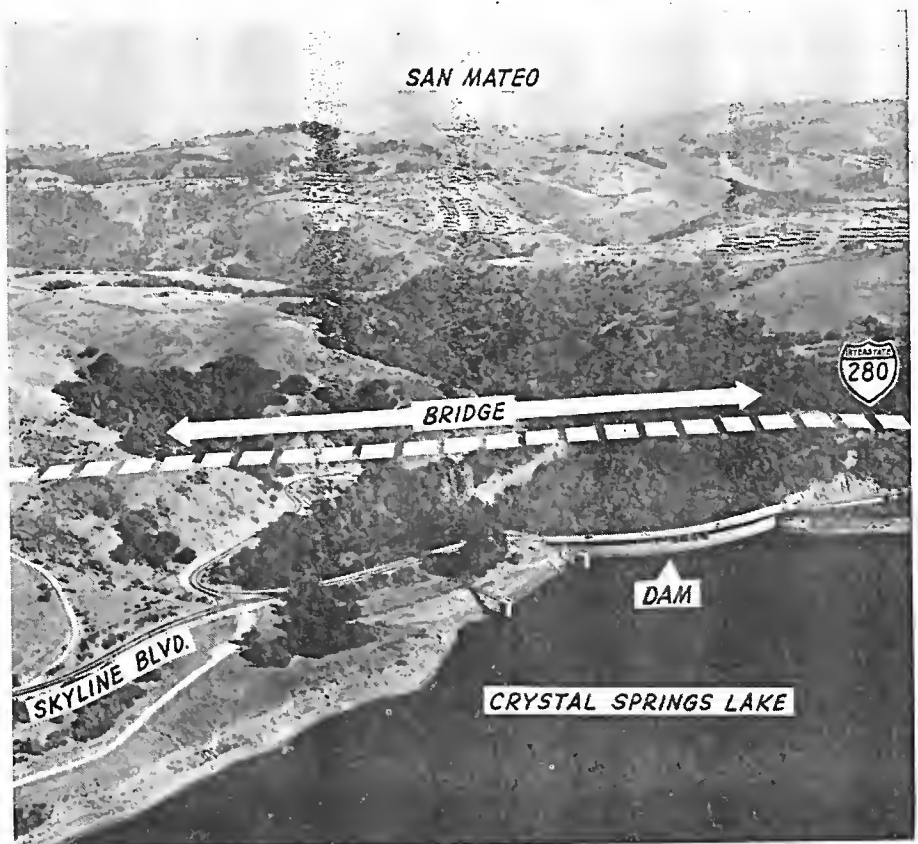
The adoption of the route from San Bruno to San Jose by the California Highway Commission on July 23, 1958, set the stage for the commencement of design study. Location studies were still in progress for 8 miles of the route north of San Bruno to the San Mateo County Line. A route for this portion generally following the existing Junipero Serra Boulevard was adopted in 1960, thus establishing the general route in its entirety. The Junipero Serra Freeway had been located and approved as a basic 8-lane interstate freeway with minimum median width of 22 feet.

Freeway Agreements

Preliminary to actual design, it is necessary to negotiate agreements with each city and county involved in location of the freeway. The number and location of interchanges which



An easterly view showing the Crystal Springs Lake in the foreground. Residential development has reached the east boundary of the watershed lands in this area.



Looking east along San Mateo Creek Canyon. The Crystal Springs Lake and Dam will be visible from future bridge over the canyon, providing a breathtaking view for future motorists.



A westerly view of the Crystal Springs Lake and Dam showing the coastal hills in the background. The future bridge will be about 1,700 feet long across the canyon and about 100 feet above the dam.

relate directly to the traffic service afforded each community, establishing which local streets would be carried over or under the freeway, and which would be cut off by the construction of the freeway, are all part of what is known as a Freeway Agreement negotiated between the State and local jurisdiction. Since 1958, 18 freeway agreements have been executed with the cities and counties for the Junipero Serra Freeway.

Once the general details of the freeway interchanges and road separations have been worked out with local authorities, the Division of Highways can proceed with detailed design. Numerous special design problems have been encountered in the design of this freeway, including preservation of the pure water impounded in the San Andreas and Crystal Springs reservoir.

Design Problems

One major problem in the design of the freeway in northern San Mateo County has been the increased subdivision activity bordering the adopted location. Every effort is made to cooperate with local agencies and keep to a minimum the number of improved properties required to build the freeway. The early adoption of the route, and the relatively few improvements which need be disturbed,

emphasize the advantage of advance planning.

A depressed 12-lane freeway is planned in Daly City where two major traffic corridors coincide. The north-south corridor includes the Junipero Serra Freeway in San Mateo County and Junipero Serra Boulevard in San Francisco. The east-west cor-

ridor includes the Sign Route 1 Freeway (from the coast) and the Southern Freeway in San Francisco. These two traffic corridors coincide for over a mile and will carry an estimated 150,000 vehicles each day by 1975. This is in excess of volumes presently carried by any freeway in the Bay area and requires special design study.

The possibilities of using a dual-system of lane arrangement, or what amounts to a freeway within a freeway, were studied and rejected because of excessive right-of-way requirements and inherent inflexibility in the event of unforeseen traffic distribution.

In southern San Mateo County, it will be necessary to bridge the proposed two-mile long, underground, linear accelerator planned for Stanford University. The proposed Ladera Dam flood control and water retention project will further complicate design of the freeway through Stanford lands, and consideration of its possible future construction resulted in some modification of both route and design.

A Beautiful Highway

The Division of Highways has been in contact with many public agencies and private organizations interested in



Looking north along Skyline Blvd. on location through the watershed lands of the City and County of San Francisco. Modifications to the Crystal Springs Golf Course are planned.

esthetic treatment for this freeway. The State Division of Beaches and Parks, the San Mateo County Park and Recreation Commission, the San Mateo County Horsemen's Association and the Tri-County Committee for Freeway Beautification, composed of representatives from San Mateo, Santa Clara and San Francisco Counties, have exchanged ideas and information designed to preserve the natural beauty of the areas through which the freeway will pass.

In areas of rugged terrain and wherever feasible, separate alignment and grades for each roadway will be used. This "split level" design will be used extensively in both San Mateo and Santa Clara Counties in order to better fit the country and minimize cuts and fills. In some instances, median planting areas may exceed 100 feet in width.

A new high-level bridge will carry the eight-lane freeway over San Mateo Creek Canyon. The bridge, not yet designed, will be about 1,700 feet long and over 275 feet above the canyon floor. The bridge site will be just east of Crystal Springs Lake Dam and future motorists may anticipate a breathtaking view of the lake.

Construction Units

Present plans call for 16 separate construction projects extending a total distance of almost 50 miles from San Francisco to San Jose. The first of these, scheduled for construction in 1962, starts in San Jose at the San Jose-Los Gatos Freeway and extends northerly for approximately 4.5 miles to Doyle Road. \$4,750,000 has been included in the 1962-63 State Highway Budget for construction of this first unit. It is hoped that the entire freeway will be constructed, under construction, or financed within five years. Since this route is part of the Interstate Freeway System, federal financing will amount to about 92 percent.

The total cost is estimated at \$145,000,000—about \$110,000,000 for construction and \$35,000,000 for rights-of-way. Of the latter amount, approximately \$7,000,000 has already been expended and another \$11,000,000 has been made available in state highway budgets through June 30, 1963.



A westerly view of San Andreas Lake and Skyline Blvd. Development in foreground within the City of Millbrae is typical of other areas adjacent to the freeway location in northern San Mateo County. In spite of heavy development, only an estimated 84 improved properties need be moved in the 35-mile stretch from San Bruno to San Jose—thanks to advance planning.

When completed, this scenic, interstate freeway will provide much needed relief for peninsula traffic, doubling the existing freeway capacity south of San Francisco and will relieve heavy congestion now experienced in Bayshore Freeway. It will

doubtless serve to accelerate development of the hills west of peninsula cities and in years to come be as familiar to peninsula travelers as the El Camino Real of old or the Bayshore Freeway today.

L.A. Design Chief Ralph V. Chase Retires

Ralph V. Chase, Assistant District Engineer for District VII in Los Angeles, retired early this year after almost 28 years with the Division of Highways. Since 1956 he had been in charge of design for state highways in Ventura County and the north portion of Los Angeles County.

In his career with the division, Chase spent five years in construction and close to 23 years in design. He was Resident Engineer on

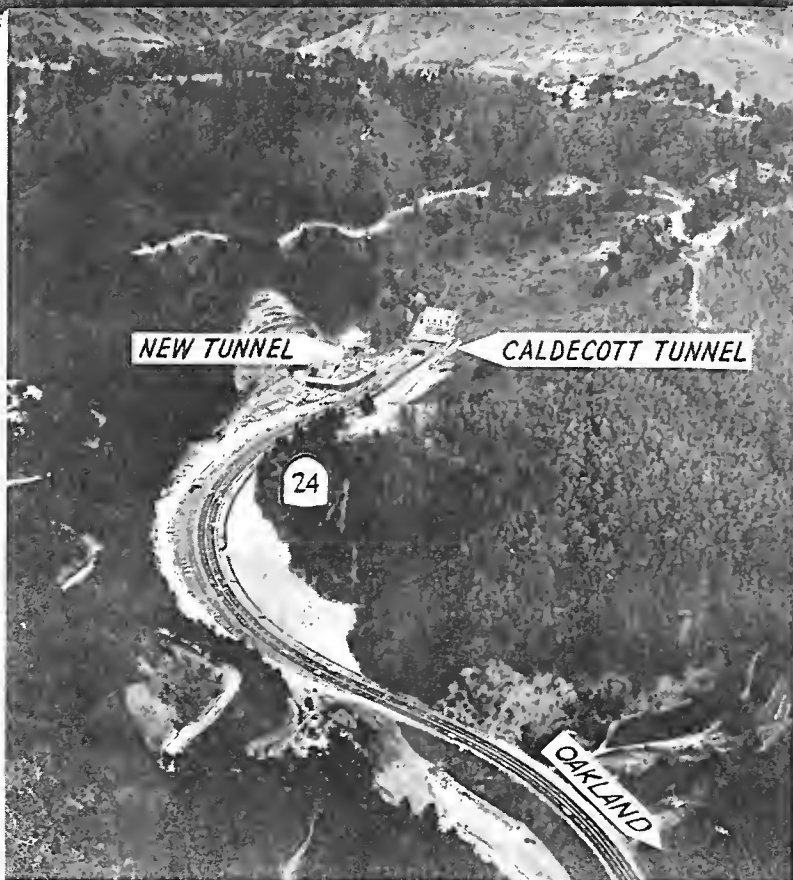


RALPH V. CHASE

portions of the Angeles Crest Highway and the Ventura Freeway. As a senior highway engineer he supervised design of the Harbor Freeway and portions of the San Diego and Golden State Freeways.

A native of Deer River, Minnesota, he attended grade school in Idaho, Missouri, and Minnesota, and high school in Minneapolis, Minnesota. He studied engineering at the University of Minnesota and the University of Southern California.

He and his wife, Clare, have one son, Donald.



Construction progresses on the new Caldecott Tunnel Portal at the west end of the existing tunnel. Funds have been budgeted to replace the present four-lane undivided approaches on Sign Route 24 with an eight-lane freeway.

Bay Area Report

By J. P. SINCLAIR

Assistant State Highway Engineer



A CENTURY AGO, waterways were the key to the growth of California. Hundreds of ships coming around the Horn brought people, tools and material to develop the newly discovered goldfields. On the Sacramento and the San Joaquin Rivers, thousands traveled by boat to seek their fortunes in the headwaters of the Sierras.

Today the great waterways handle only a small portion of the total traffic. The railroads, which moved so many people and goods from place to place in the early part of this century, have also assumed a lesser role. Replacing these time-honored modes of travel, the boat and the rail, are miles and miles of concrete and asphalt highways and freeways two, four and eight lanes wide. The Golden Gate, the Carquinez Straits and the San Francisco Bay, have been spanned by mighty bridges to accom-

modate the ever-expanding tide of automobiles.

The task of the District IV highway engineers in the Bay area, is not only to provide a means of safe and rapid travel for this growing tide of motorists with their cars and trucks, but to insure the same pleasant prospect for the additional thousands who will be driving on Bay area highways in future years.

Commuters Increase

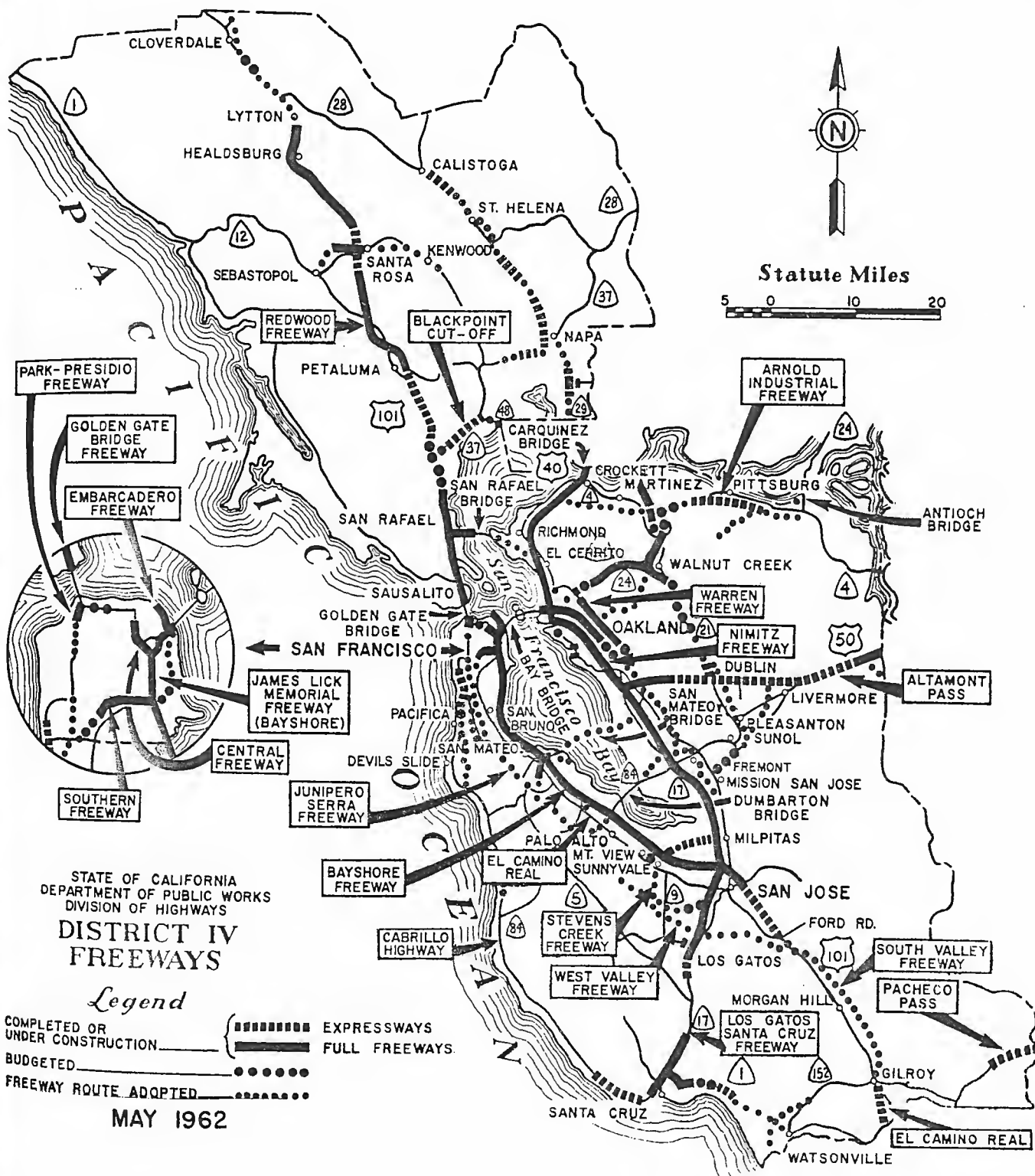
Unlike gold rush days, when much of the incoming population left the Bay area seldom to return, many now make a two-way trip daily. They earn their livelihoods in the metropolitan communities of the Bay area, such as San Francisco, Oakland, Richmond, San Jose and Santa Rosa, and often choose suburbs on either side of the Bay or several counties away to join their families in residence or spend their leisure time.

From San Francisco, and Oakland, freeways now provide effortless travel north to Santa Rosa and Sacramento and south to San Jose. More than ever

before, the continuity of route development is in evidence.

Completion of the Bayshore Freeway from San Francisco to San Jose, the recent completion of three contracts on the MacArthur Freeway, the Southern Freeway now under contract throughout most of its length, the rapid closing of the gaps on the US 101 Freeway through Marin and Sonoma Counties, all are examples of major route development. One can now drive from Watsonville to the Carquinez Bridge, the entire length of District IV, and not stop for a single traffic signal.

This has not always been accomplished without controversy. That so much has been achieved with little or no controversy is testimony to the willingness of those who build for the future to consider the views of those who would preserve the past. When viewed against the backdrop of Bay area history, beauty, commerce and trade, the achievements listed below become an important part of the growth of not only the Bay area but of California itself.





The Imola Avenue Interchange in Napa where Sign Routes 12, 29 and 37 join.

age roads will be included in the southerly portion between Dry Creek and California Drive. Work will also

include improvement of drainage facilities in cooperation with Napa County.

SAN FRANCISCO COUNTY

The major construction effort for the past few years, in the City and County of San Francisco, has been concentrated on the Southern Freeway. When complete, this freeway will connect James Lick Memorial Freeway (Bayshore Freeway) with the future Junipero Serra Freeway in Daly City.

The first unit was opened to traffic in July 1960, with the completion of the \$7,565,000 interchange complex at the James Lick Freeway. The \$4,273,000 unit between Mission Street and the completed interchange is presently under construction by Charles L. Harney, Incorporated. When completed in 1963, it will provide the first usable portion of the six-lane, ultimate eight-lane, freeway. Two major overcrossing structures,

serving local traffic to and from Alemany Boulevard, are included, as well as overcrossings for Mission Street, Justin Drive, and a pedestrian bridge near Gladstone Drive.

Work started in December 1961 on the next unit extending from 1.1 mile west of Mission Street to Ocean Avenue. This \$6,080,000 project was also awarded to Charles L. Harney, Inc., and consists in grading and paving for a six-lane freeway, constructing 13 traffic separations, pedestrian crossings and interchange structures, and nine retaining walls. Overcrossings are being constructed at Paulding Street and Baden Street, and pedestrian overcrossings will be provided at Theresa Street and Lamartine Street. The remaining nine structures will be overcrossings and undercrossings in the

Sign Route 128

Two projects were completed on State Sign Route 128 northeast of Napa during the past year. \$18,500 was expended for line changes to avoid slipouts near Lake Berryessa, about 6.1 miles east of the junction with Sign Route 37, and a \$38,000 contract was completed in March of this year for reconstruction about 21 miles northeast of Napa. This year, \$50,000 is budgeted for grading and paving of an 0.8-mile portion of Sign Route 128 between Pope Valley Road and the Monticello Dam relocation.

Sign Route 37

On Sign Route 37, \$72,000 was expended by the State with an additional contribution of \$16,000 by Napa County for realignment and widening of the existing two-lane highway between 3 miles and 12 miles northeast of Napa. Bids were opened May 31 for a \$160,000 contract to widen this route at seven locations between Vichy Springs and Sign Route 128. A minimum 26-foot all-paved section will be constructed. Upon completion of the project, only about 2.5 remaining miles of the highway between Napa and Route 128 will require widening.

vicinity of San Jose Avenue, to furnish traffic service to San Jose Avenue, Monterey Boulevard, Bosworth Street and Lyell Street.

Ocean Avenue

The next project, extending from Ocean Avenue to Orizaba Avenue, will be under construction shortly, and is expected to be completed at about the same time. A total of \$4,600,000 has been budgeted for it. Interchange facilities will be constructed at Ocean Avenue and ramps will be provided for traffic to and from San Jose Avenue in the vicinity of Plymouth Avenue. Major structures include overcrossings for San Jose Avenue in the vicinity of Broad Street and Mount Vernon Avenue, Geneva Avenue and Ocean Avenue. Under-

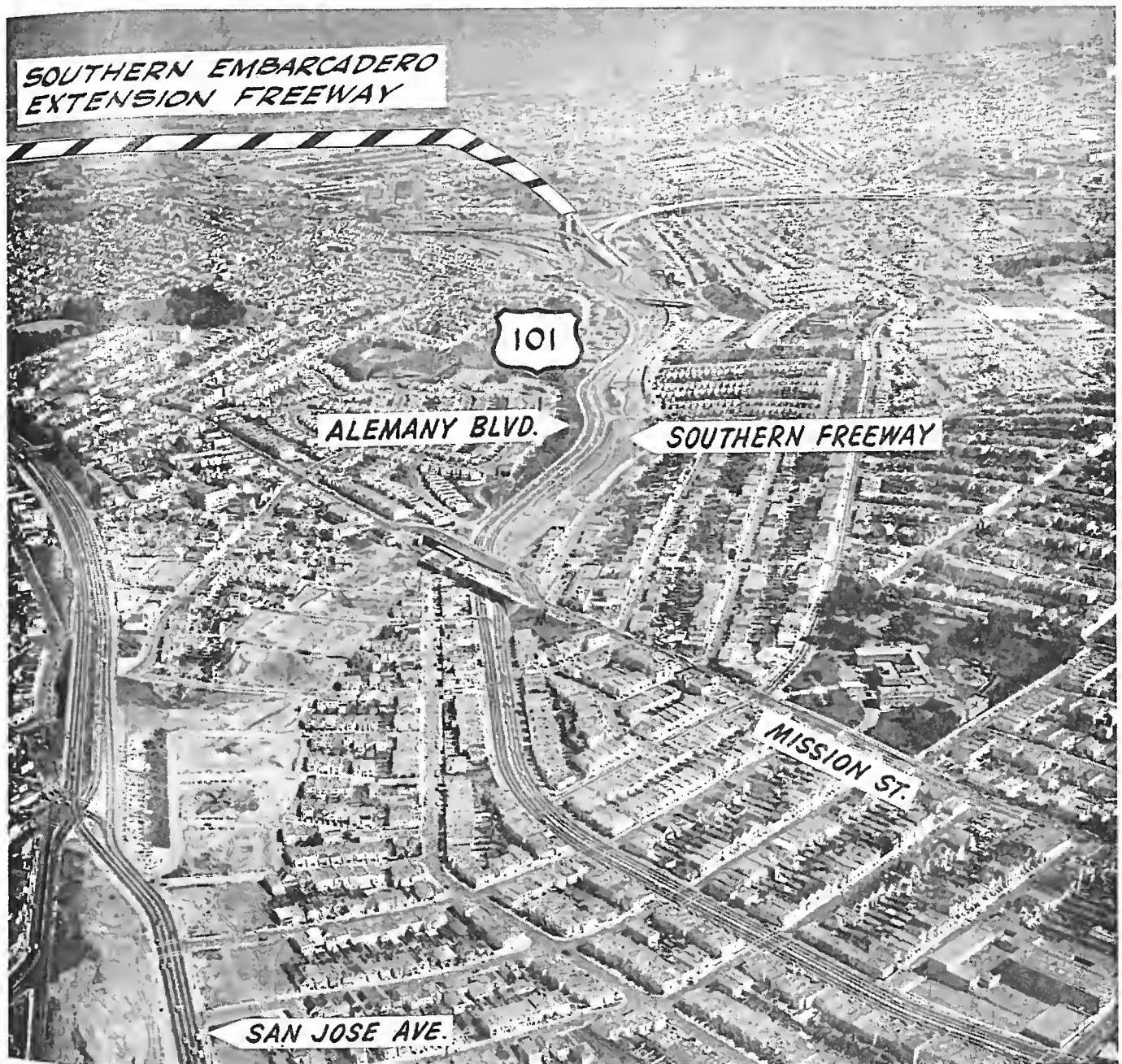
crossing structures will be constructed for the freeway and ramps at San Jose Avenue and Sickles Avenue, and pedestrian overcrossings are planned for Whipple Avenue and Havelock Street.

The first two units of the Southern-Embarcadero Extension Freeway have been budgeted. Construction of the

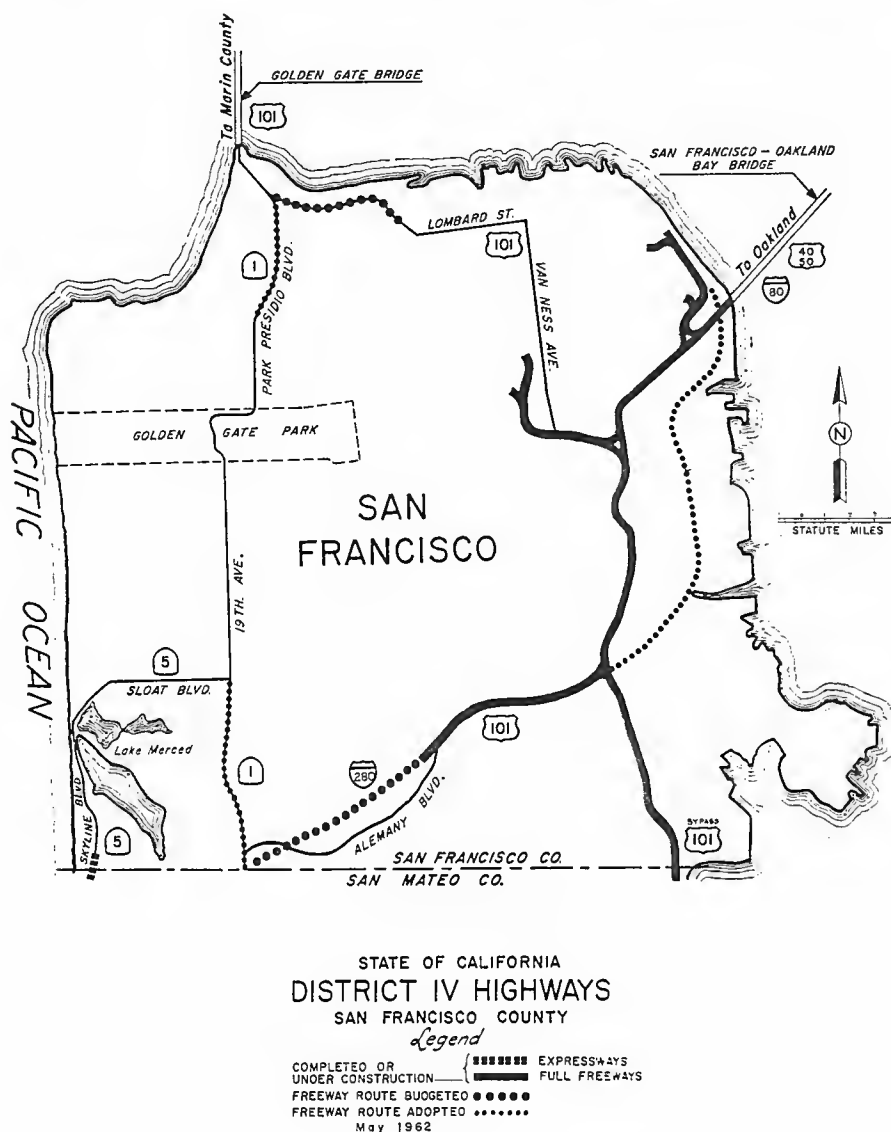
double deck viaduct between James Lick Memorial Freeway and Newcomb Street should be underway this summer. A total of \$5,500,000 has been budgeted for this construction, which will not provide a useable unit, however, until completion of the second unit between Newcomb Street and Army Street.

This second unit, scheduled for construction in 1963, will provide the transition from the double deck viaduct to a single deck viaduct, and freeway facilities to Evans Street, at a cost of approximately \$5,580,000. An on-ramp will be built to Army Street.

During 1961 the route for the Southern-Embarcadero Extension was



The Southern Freeway on US 101 in San Francisco. The future location of the Southern-Embarcadero Freeway extension is shown in the background. The portion between the James Lick-Southern Freeway Interchange and Mission Street is under construction and the right of way west of Mission Street has been cleared.



SAN MATEO COUNTY

For many years the major demand for highway facilities was on the easterly side of the Peninsula, connecting the many suburban communities which had grown up along the Bay with San Francisco and San Jose. However, in recent years, a growing need for additional high standard, north-south arteries through the central, hilly portion and along the ocean coast, as well as east-west connections, has become more apparent.

19th Avenue Freeway

The first major step to fill the need for an east-west freeway is the present construction on State Highway Route

105 (19th Avenue Freeway) between West Hillsdale Boulevard and South Delaware Street in San Mateo. Eventually, this freeway will extend from Half Moon Bay to Hayward via the San Mateo-Hayward Bridge.

The unit presently under construction by L. C. Smith and Concar Ranch and Enterprises provides access to the new campus of the College of San Mateo. The 2.6-mile project will cost approximately \$4,652,500 including contributions of \$100,900 from the County of San Mateo, \$76,500 by the Southern Pacific Railroad and \$6,000 by the city. Four lanes are under construction between West

adopted by the California Highway Commission. When complete, this freeway will provide much needed relief to the Bayshore Freeway north-erly of its interchange with the South-ern Freeway.

Ramp Connections

Funds are budgeted in the amount of \$1,470,000 and design is underway for additional ramp connections to the Embarcadero Freeway between Howard and Vallejo Street. These ramps will provide service to Clay and Washington Streets within the Golden Gateway Redevelopment area, which is scheduled for clearance early in 1963.

Three landscaping projects were completed during the past year on the James Lick, Southern and Central Freeways, and funds are budgeted for a similar project on the Embarcadero Freeway, between First and Stewart Streets. Eucalyptus trees were planted in the vicinity of the Southern-James Lick Freeway Interchange and acacia, tea trees, and other shrubs, were placed on this contract as well as the other two. Ivy plants and ice plant cuttings were used on these projects for ground cover.

Hillsdale Boulevard and El Camino Real, easterly of El Camino, a six-lane freeway will be constructed. Traffic separation structures and interchanges are being built at Alameda de las Pulgas, El Camino Real (US 101) and South Delaware Street, and an undercrossing will be constructed at Palm Avenue. This contract also includes an overhead crossing over the main tracks of the Southern Pacific Railroad near Pacific Boulevard.

Cabrillo Highway (Sign Route 1)

On State Sign Route 1, on the west coast, \$3,850,000 is budgeted for a 3.2-mile, initial four-lane, ultimate six-

lane freeway between 1.1 mile south of Sharp Park Road and 0.4 miles north of Manor Drive in Pacifica. This project includes an interim channelization at Westport.

Overcrossing structures will be built on this contract at Sharp Park Road, Clarendon Avenue, Paloma Avenue and at Manor Drive. A full interchange will be constructed at Sharp Park Road and access ramps will be provided in the vicinities of Clarendon Avenue, Belle Vista Avenue, Milagra Drive and Monterey Road. Pedestrian separations will be built at Fairway and Milagra Drives.

South of Half Moon Bay on Sign Route 1 (Cabrillo Highway), work is under way on a \$592,000 contract between 0.5 mile south of and 0.3 mile north of Tunitas Creek. The work includes construction of a new bridge across Tunitas Creek and improving the approaches.

El Camino Real (US 101)

Several contracts were completed on El Camino Real (US 101) during the past year, including major widening between Taylor Boulevard and Santa Helena Avenue in Millbrae. Approximately \$254,000 was spent on this 0.8-mile project to widen the existing four-lane conventional roadway to a six-lane divided highway. Elsewhere, traffic signals and lights were installed or modified and channelizations constructed on two separate projects on El Camino Real. One location was at Broadway in Redwood City and the other between Menlo Avenue and Partridge Avenue in Menlo Park.

Funds are budgeted for 1.7 miles of widening on El Camino Real between Millwood Drive in Millbrae and Euclid Avenue in San Bruno. \$530,000 has been budgeted for this project to widen the existing four-lane conventional roadway to a six-lane divided highway. \$290,000 will be provided by the Cities of Millbrae and San Bruno to construct adjacent parking aprons and sidewalks and install street lighting.

US 101 Bypass (Bayshore Freeway)

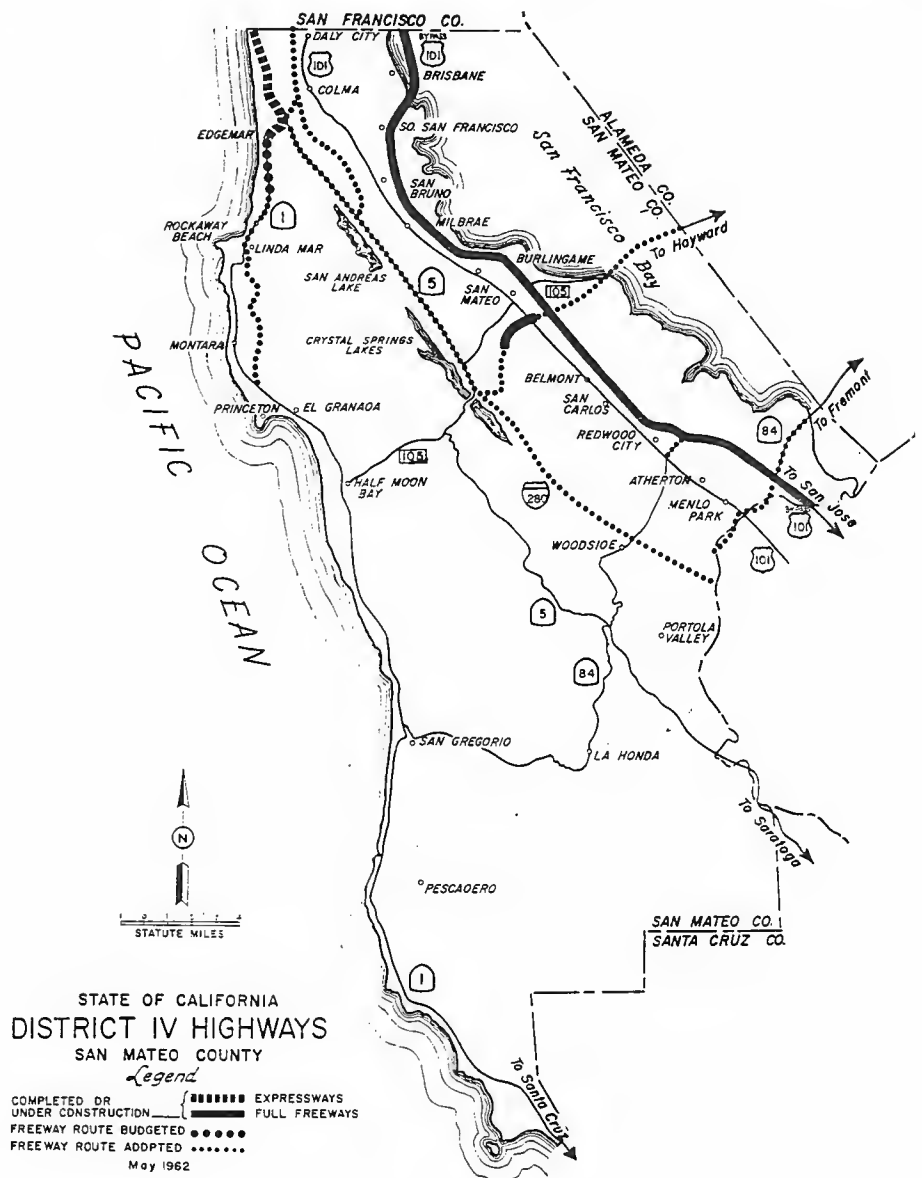
The major improvement on Bayshore Freeway (US 101 Bypass) in San Mateo during this period was the

completion of 7.5 miles of widening to eight lanes between Grand Avenue in South San Francisco and Peninsular Avenue in Burlingame. This \$1,662,000 contract eased the severe peak-hour traffic congestion in the vicinity of the San Francisco International Airport. In addition to the widening and resurfacing of the existing traffic lanes to provide a smoother riding surface, the work included the construction of a diagonal ramp in the southwest quadrant of the Millbrae Interchange and improvement of ramps in the other quadrants. Double blocked out metal beam barrier was placed in the median on this project

and 19 illuminated signs were installed. L. C. Smith was the contractor.

Presently under way is a contract for \$280,000 for placing either cable chain link or blocked-out metal beam barrier on the remaining portions of Bayshore Freeway between Sierra Point Overhead near South San Francisco and Redwood Creek Bridge in Redwood City. Sign structures and sign lighting systems are also to be installed on the 17.4-mile project.

Bids were opened May 2 for resurfacing portions of US 101 Bypass between Butler Road in South San Francisco and Third Street Overcrossing





The 19th Avenue Freeway under construction in San Mateo. The future connection to the new San Mateo-Hoyward Bridge, which will be constructed by the State Division of Bay Toll Crossings, is shown in the background.

in San Francisco. \$420,000 is allotted for this 3.5-mile contract, which will provide a higher quality riding surface over the existing Candlestick fill cutoff.

Bayshore Landscaping

A \$71,000 landscaping contract was completed in April of last year between 16th Avenue in San Mateo and Bransten Road in San Carlos.

Two additional landscaping contracts are under way; between Spruce Avenue in Redwood City and University Avenue in Palo Alto. 4.1 miles of Bayshore is being landscaped at a cost of \$84,000. South of University Avenue to Natadero Creek, a 1.9-mile project will cost \$61,400.

Projects were also completed or are budgeted on several of the other

routes in the county. \$42,700 was expended on a 0.2-mile realignment of State Sign Route 84 approximately three miles north of Woodside. Traffic signals and lights were installed and a channelization was constructed at Eastmore Avenue at the south city limits of Daly City on existing Junipero Serra Boulevard at a cost of \$18,900.

An amount of \$60,000 is budgeted for signals and channelization at the intersections of Sharp Park Road and Westborough Boulevard and Skyline Boulevard (State Sign Route 5). A channelization will also be constructed at the intersection of Skyline with Manor Drive and \$28,000 is budgeted for this purpose.

Beaches and Parks

Funds are also budgeted for Division of Highways participation in the development of Thornton Beach State Park by the Division of Parks and Beaches. Bids were opened May 2 on this project for constructing a two-lane access road, parking areas, and a water and sewer system for this newly established metropolitan recreational area for picnicking, fishing, hiking and beach sport. The access road will utilize a large portion of relinquished State Sign Route 1 from Alemany Boulevard and the work includes 1,600 feet of resurfacing and 600 feet of realignment.

The major portion of the work, \$85,000, is being paid by the Division of Parks and Beaches, the highway allotment being \$25,000.

SANTA CLARA COUNTY

Bayshore Freeway

Highway development in rapidly-growing Santa Clara County has recently included completion of two contracts converting Bayshore Freeway (US 101) to full freeway standards and the recent award of the first contract for construction of Junipero Serra Freeway (Interstate 280). Other contracts were completed, are under way or are budgeted on US 101 to the south, the San Jose-Los Gatos Freeway, and on State Sign Route 9 in and near Mountain View.

Approximately 15 years after the first contract on the Bayshore Freeway was awarded, a continuous freeway extending 49 miles between San Jose and San Francisco has been completed. In December of last year, the first of two contracts on Bayshore was completed between Charleston Road in Mountain View and the Guadalupe River near San Jose. This work, performed by L. C. Smith and Concar Ranch and Enterprises, in-

cluded construction of a freeway section on State Sign Route 9 from Bayshore Freeway to 0.2 mile east of Borregas Avenue, a \$4,518,000 project.

The final gap in the freeway was closed in February as part of the second contract performed by Allan M. Campbell Company on a 6.1-mile section between Brokaw Road and Morse Avenue. This contract, completed in April of this year, cost approximately \$5,672,000 and included eleven structures of four interchanges

and two grade separations. (For a detailed report on these two projects, see "Bayshore Freeway," by W. G. Remington, March-April 1962 issue of *California Highways and Public Works*.)

US 101—San Jose and South

Also completed during the past year was a contract for \$51,500 for constructing a channelization and left turn lane at McKee Road interchange in San Jose.

South of San Jose on US 101 and US 101 Bypass, one contract was completed and two are under way. \$896,000 is being expended to construct an overcrossing and interchange at Tully Road on US 101 Bypass. Between El Toro Avenue in Morgan Hill and Ford Road, the junction with US 101 Bypass, an \$887,000 contract is in progress to widen and reconstruct existing US 101. This work includes drainage facilities and left turn lanes.

A \$103,000 landscaping project is now in progress between Brokaw Road and Coyote Creek, in and near San Jose.

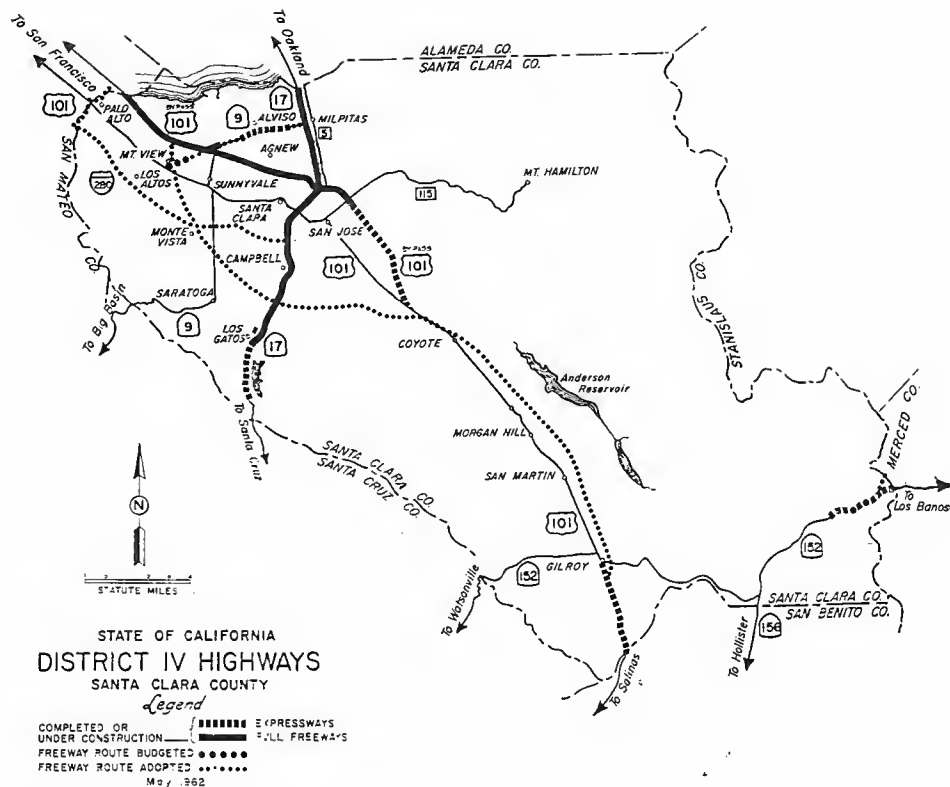
El Camino Real (US 101)

North of San Jose on El Camino Real (US 101), traffic signals and lights were installed and a channelization was constructed at Lincoln Street in Santa Clara. The City contributed approximately one-half of the funds for this \$12,850 contract.

Farther north, in Palo Alto, a 2.1-mile project, costing \$1,440,000, is under construction by McGuire & Hester, between University Avenue and Matadero Creek. El Camino Real is being widened from four lanes to a six-lane divided city street and the work includes installation of a lighting system, placing longitudinal storm drains, and landscaping median islands. The existing Mayfield Avenue pedestrian undercrossing is being extended.

Junipero Serra Freeway

An amount of \$1,200,000 is budgeted to widen existing State Sign Route 17 freeway to six lanes between Forest Avenue and Bayshore Freeway. Coleman Avenue Interchange will be reconstructed as a part of this work.



The first contract on Junipero Serra Freeway (Interstate 280) was recently awarded. It includes grading and paving 4.3 miles of freeway between State Sign Route 17 freeway and west of Saratoga Avenue and adding an additional lane on the inside of existing Sign Route 17 between Moorpark Avenue and Forest Park Avenue. This \$4,750,000 contract will modify the existing full cloverleaf interchange at Stevens Creek Road and Sign Route 17 to accommodate collector roads and direct connections to Junipero Serra freeway. Interchanges will also be constructed at Santa Clara-Los Gatos Road and at Saratoga Avenue. Two pumping plants and two pedestrian separations will be built and eleven traffic structures will be constructed or modified. (An extensive account of the planning and design studies for the Junipero Serra Freeway was published in the January-February 1962 issue of *California Highways and Public Works*.)

Sign Route 17

On State Sign Route 17 westerly towards the Santa Cruz county line, \$9,700 is to be expended to widen the

existing highway and install guard rail. Two other contracts were completed on Sign Route 17 in Campbell. The southbound freeway off-ramp was widened and signals installed at Hamilton Avenue at a cost of \$25,300. Lighting, signals and channelization were constructed at Camden Avenue at a cost of \$53,800.

In San Jose, a 2.6-mile landscaping contract is under way between Bascom Avenue and Bayshore Freeway. Twelve hundred trees, 5,200 shrubs and 363,000 ground cover plants are being placed on the \$176,200 contract; along with an irrigation system.

Sign Route 9

On State Sign Route 9, \$408,000 was expended on improvements between 0.2 mile east of San Jose-Alviso Road and Nimitz Freeway. This project, completed in January, included 2.1 miles of widening and realignment to eliminate sharp curves in the former highway. A major portion of the line change will serve as the northerly lanes of a future freeway. As a part of the work, a new bridge was constructed across Coyote Creek. In Sunnyvale, traffic signals and highway lighting were installed

and channelizations were constructed at the intersection of State Highway Route 113 with Java Drive-Fair Oaks Avenue and at Caribbean Drive-Lawrence Station Road at a cost of \$21,650. West of Saratoga, 3.1 miles of shoulders were reconstructed and resurfacing placed at a cost of \$86,100.

Funds are budgeted for two projects on Sign Route 9, one at the Middlefield overcrossing structure and approaches in Mountain View on the route of the future Stevens Creek Freeway. Between El Camino Real (US 101) and 0.4 mile north of the Southern Pacific Railroad near Bernardo Avenue in Mountain View, \$1,475,000 is budgeted for a project which will provide a four-lane expressway from El Camino Real to

Church Street, a four-lane divided freeway between Church Street and Sylvan Avenue and a two-lane conventional highway between Sylvan and Bernardo Avenues. An interchange will be constructed at Dana Street and structures will be built at Stevens Creek and East Mountain View overhead. The latter will be two-lane and eliminate the present grade crossing. The portion between Stevens Creek and Sylvan Avenue will be depressed.

A contract was recently awarded for widening Sign Route 9 from two to four lanes on the 5.4 miles between the railroad crossing at Azule and El Camino Real in Sunnyvale with signals and left-turn storage lanes at Prospect Avenue, Bollinger Road,

Stevens Creek Road, Homestead Road and Fremont Avenue. \$740,000 has been allotted for this project.

Other Projects

A little more than four miles of Sign Route 152 was widened and resurfacing was completed in September between San Felipe and Bell's Station at a cost of \$200,000. Drainage facilities were also reconstructed east of Prunedale Avenue near Gilroy on this route at a cost of \$19,900.

Funds are budgeted for widening Jones Creek Bridge east of Gilroy on Sign Route 152 and bids were opened in May for installing underdrains at a cost of \$30,000 between 2.6 miles north of State Highway Route 42 near Saratoga gap and the San Mateo county line on State Sign Route 5.

SANTA CRUZ COUNTY

The first contract to convert the existing State Sign Route 1 expressway between Santa Cruz and Rob Roy Junction to full freeway standards was completed by L. C. Smith in January of this year.

A two-quadrant cloverleaf was constructed at 41st Avenue and a frontage road was built from South Rodeo

Gulch Road to 17th Avenue. This 1.5-mile contract between Soquel Wharf Road in Capitola and Soquel Avenue was completed at a cost of about \$594,000.

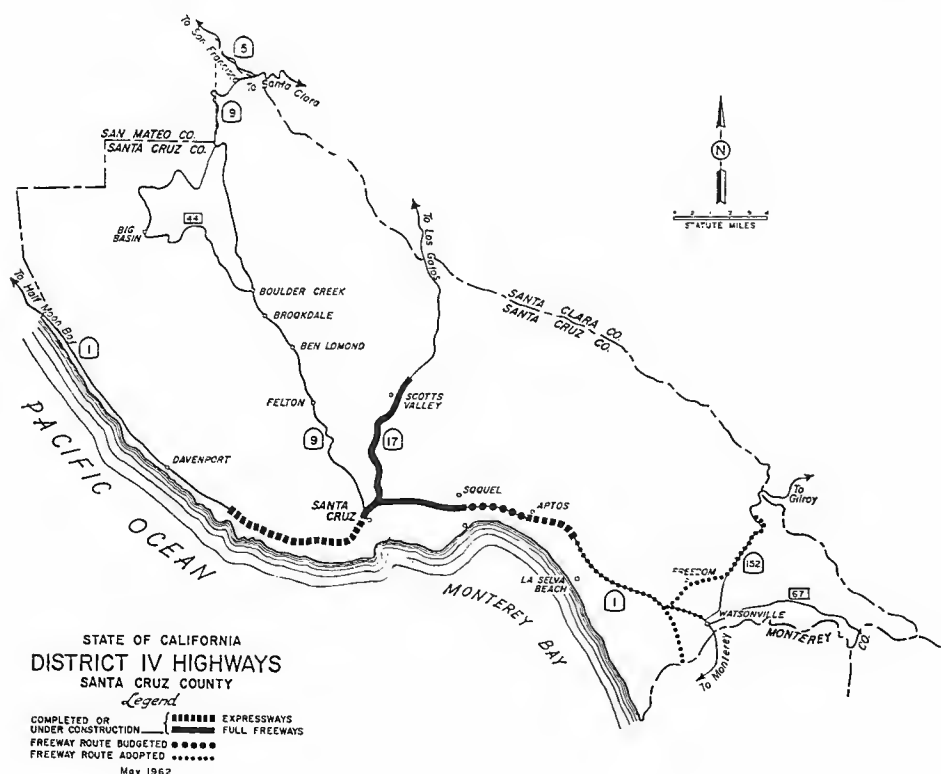
A similar project between 0.2 mile west of Aptos Creek and 0.3 mile east of Soquel Wharf Road is budgeted for early construction. A two-quad-

rant cloverleaf interchange will be constructed at State Park Drive and a diamond interchange will be built at Park Avenue. This 2.9-mile project will cost approximately \$1,250,000 and will include frontage roads.

An amount of \$180,000 is budgeted for repaving 7.1 miles of State Sign Route 1 between Rob Roy Junction and Main Street in Watsonville. North of Watsonville, a contract was completed to reconstruct the base and resurface 18 miles between south of Davenport and Princeton. This \$448,000 project was required to repair damage to Sign Route 1 resulting from the hauling of large rock for constructing the Pillar Point breakwater.

Sign Route 17

On State Sign Route 17, a three-mile section of four-lane freeway was completed between Granite Creek and Glen Canyon Road by Edw. Keeble Construction Co. The completion of this contract provides a combination freeway-expressway on Sign Route 17 beginning in the vicinity of Santa's Village and terminating in Santa Cruz. This relocation bypasses the former three-lane highway through Scotts Valley, which will continue to serve local traffic. Interchanges were constructed at Granite Creek and Glen Canyon and an over-





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HUNTERS POINT FREEWAY

LEGISLATIVE ROUTE 253



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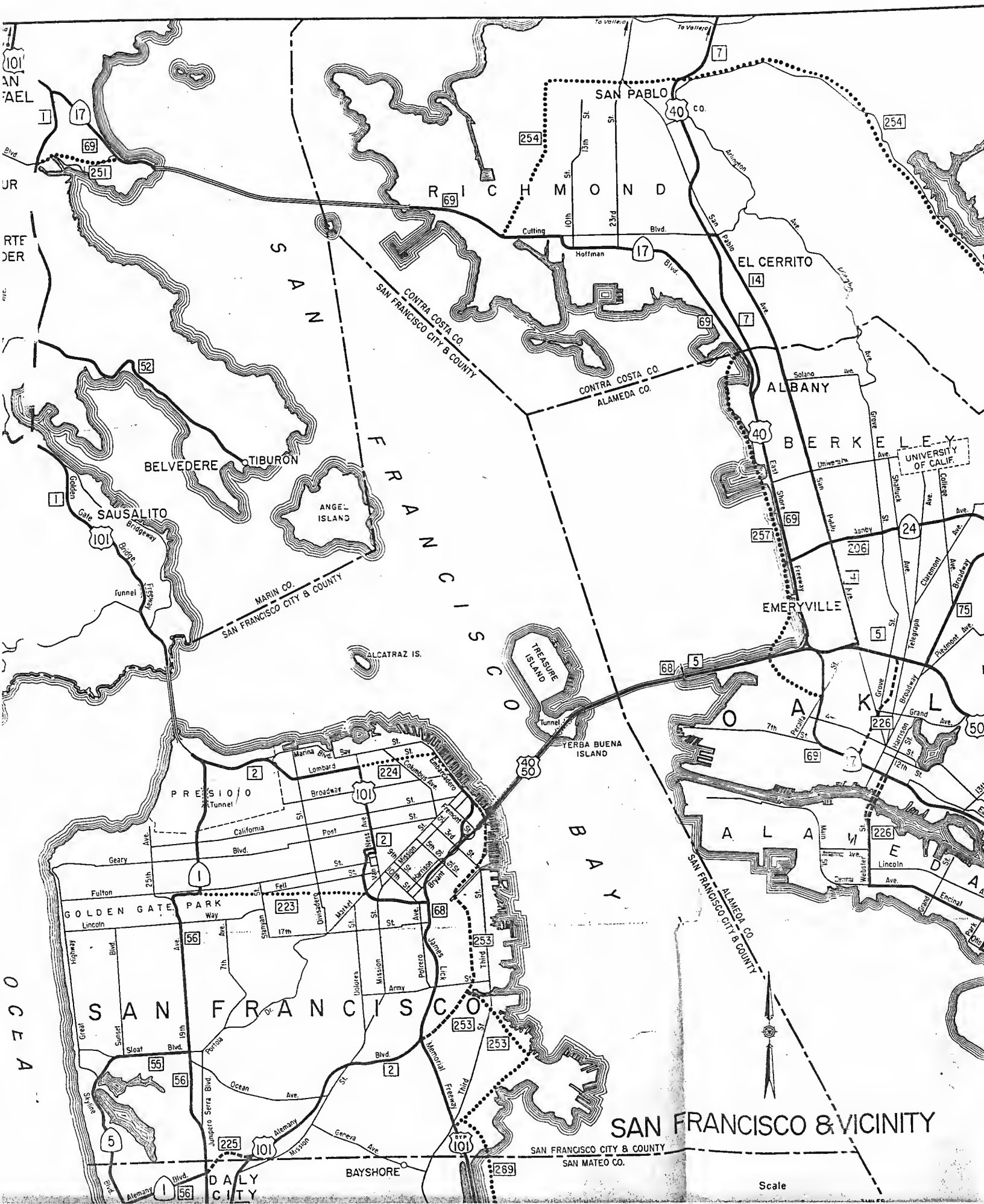
**CALIFORNIA
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